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TRANSIENT CEREBRAL PARALYSIS IN HYPERTENSION AND IN CEREBRAL EMBOLISM

With Special Reference to the Pathogenesis of Chronic Hypertensive Encephalopathy

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A variety of cerebral attacks occur in hypertension. In cerebral hemorrhage, consciousness is lost suddenly and is not usually regained before death ensues; when recovery does occur a permanent disability often remains. In thrombosis of a cerebral artery with massive infarction of the brain, consciousness is also suddenly lost, and when it is regained a hemiplegia, a hemianopia or other lesion usually remains. While the gross pathology of such cerebral attacks has been apparent since the early days of postmortem examination of the brain, there are others in which the disturbances in life are of much shorter duration and in which the appearance of the brain after death is less noticeably altered. These attacks, which are the subject of this paper, were at one time included in the symptom complex of uremia. They were first clearly distinguished from true uremia by Volhard,[1] who termed them pseudouremia, and are now generally known as hypertensive encephalopathy (Oppenheimer and Fishberg[2]). Volhard recognized that these cerebral attacks are not all of one kind and that there are clear differences both clinically and pathologically between the attacks occurring in acute and in chronic hypertension. It is with the attacks occurring in chronic hypertension that I am chiefly concerned here.

HYPERTENSIVE ENCEPHALOPATHY IN ACUTE HYPERTENSION

In hypertension of recent origin such as acute nephritis or pregnancy "toxemia," or in a chronic hypertension with recent exacerbation, attacks occur in which severe headache is followed by vomiting, drowsiness, bradycardia, convulsions and coma. These attacks may be preceded or followed by focal symptoms and signs, and clear up without residual nervous phenomena. Volhard pointed out the similarity of the clinical picture to that found in acutely raised intracranial pressure. For this reason and because of the frequent presence of papilledema, he suggested that the attacks were due to acute edema of the brain, an explanation previously suggested by Traube and subsequently adopted by Zwangemeister and others.[3] Gorke and Töppich, Blackfan and Hamilton, Volhard[4] and others have described cases in which death occurred after attacks of this kind in which evidence of cerebral edema was found post mortem. Acute edema of the brain may therefore be provisionally accepted as the pathologic basis of such attacks. Some doubt still exists as to the cause of this edema. Traube regarded it as a passive consequence of diminished blood protein and raised arterial pressure. He supposed that both of these factors usually operated and that a sudden fall in blood protein or a sudden rise in arterial pressure might further increase the passage of fluid out of the cerebral vessels into the brain substance and precipitate a cerebral attack. At that time neither of Traube's two operative factors could be measured. No clear evidence has since been produced to show that plasma protein plays any part. Hypertension has been found invariable, and Volhard, Oppenheimer and Fishberg and McAlpine[5] among others have shown that a further rise in arterial pressure often immediately precedes the attacks. Traube's explanation implies that the cerebral arterioles are relatively feebly constricted by the agent raising the arterial pressure in hypertension, so that the cerebral capillary pressure is raised. The feeble contractility of the cerebral arterioles to constrictor agents supports the hypothesis; as does the relationship that exists between pressure of cerebrospinal fluid and diastolic arterial pressure in hypertension.[6]

The current view as to the origin of cerebral edema is, however, quite different, and was put forward by Volhard, who supposed the cerebral edema due to ischemia of the brain. He considered that the cerebral arterioles were not less but more constricted than those elsewhere, so that the cerebral blood flow became so small that the capillaries were damaged by anoxia, and so allowed abnormal amounts of fluid and protein to pass out into the cerebral substance. The chief evidence produced for this widely accepted hypothesis is that a rise in arterial pressure precedes the attacks; this fact is of no great value as evidence, for it had been envisaged as a possibility by Traube when he was formulating a precisely opposite hypothesis. In 3 cases which I have observed myself and reported briefly elsewhere, the protein in the cerebrospinal fluid was not significantly different in and out of the attacks. But the strongest argument against the hypothesis is

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1. (a) Volhard, F., and Fahr, K. T.: Die Brightsche Nierenkrankheit: Klinik Pathologie und Atlas, Berlin, Julius Springer, 1914. (b) Volhard, F., in Mohr, L., and Staehelin, R.: Handbuch der Inneren Medizin, ed. 2, Berlin, Julius Springer, vol. 6, pt. 1; (c) in Bergland, H., and Medes, G.: The Kidney in Health and Disease, Philadelphia, Lea & Febiger, 1935, p. 665.

2. Oppenheimer, B. S., and Fishberg, A. M.: Hypertensive Encephalopathy, Arch. Int. Med. 41:264 (Feb.) 1928.

3. Traube, L.: Gesammelte Beitrage zur Pathologie und Physiologie, Berlin, A. Hirschwald, 1871, vol. 2, p. 551. Zangemeister, W.: Eclampsia, Ztschr. f. Geburtsh. u. Gynäk. 70:129, 1910.

4. Gorke, H., and Töppich, G.: Mercurie Chlorid Nephrosis, Ztschr. f. klin. Med. 98:113, 1923. Blackfan, K. D., and Hamilton, B.: Uremia in Acute Glomerular Nephritis, Boston M. & S. J. 192:617, 1925. Volhard, F., in Bergland, H., and Medes, G.: The Kidney in Health and Disease, Philadelphia, Lea & Febiger, 1935.

5. McAlpine, D.: Hypertensive Cerebral Attack, Quart. J. Med. 2:463, 1933.

6. Pickering, G. W.: Cerebrospinal Fluid Pressure in Arterial Hypertension, Clin. Sc. 1:397, 1934.

that the cerebral arterioles have never been found to constrict more strongly than arterioles elsewhere, to a constrictor agent; in fact, the reverse is true.

THE ENCEPHALOPATHY OF CHRONIC HYPERTENSION

Attacks similar to those just described may occur in chronic hypertension particularly if there has been a recent exacerbation, but the usual attack is quite different. To quote Volhard, "Next in frequency to headaches and vertigo there occur transitory amaurosis, hemianopia, aphasia, astereognosis, transitory monoplegia and hemiplegia and rarely epileptiform attacks." Clinically the most striking features of these attacks of sensory or motor paralysis are their brief duration, the tendency to complete resolution and the frequency with which consciousness is retained. Peabody [7] seems to have been the first to ascribe such transient attacks of paralysis to spasm of a cerebral artery, because in the case which he observed, of a man of 56 with some six transient attacks of right hemiparesis, neither a cerebral infarct nor complete occlusion of a cerebral artery was found post mortem, though the middle cerebral and other arteries were grossly atheromatous. According to this hypothesis, a cerebral artery suddenly contracts so fiercely that its lumen is almost or quite obliterated, the corresponding area of brain becomes ischemic and a corresponding localized sensory or motor paralysis ensues; after a shorter or longer interval the artery opens again, the previously ischemic brain recovers and the paralysis disappears. This hypothesis explains rather simply the clinical facts and caters to the popular demand for hypotheses involving the conception of vasospasm; hence it is almost universally accepted at the present day, certainly in the United States and Europe. The evidence for it is slight. Volhard [8a, b] argued that intermittent claudication, angina pectoris and dead fingers occurring in hypertensive disease gave evidence of similar transient and localized vascular spasm elsewhere; but it is now known that the first two are due not to spasmodic but to organic arterial occlusion and that dead fingers are not usually associated with hypertension and that they represent a peculiarity in the local response of digital arteries to cold. Osler [9] in supporting the hypothesis was influenced by 2 cases in which cerebral disturbances and dead fingers were associated; his first case in which digital gangrene, epileptiform attacks and bloody urine occurred together only in winter would now be recognized as an example of cold hemolysis; his second was an unusual and complicated case terminating in gangrene of an arm and death in coma, only to have been explained by a necropsy that was not obtained. The most important evidence for the hypothesis is obtained by examination of the brain after death. No local cerebral lesion was found by Peabody, and the small foci of cerebral degeneration found by Westphal [9] were held to be inadequate to account for symptoms in his cases. On the other hand, Davison and Brill [10] thought the small degenerative foci were the cause of symptoms in their 7 cases. The most extensive and most objective account of the cerebral lesions is probably that of Rosenberg,[11] who examined the brains carefully in 17 cases of malignant hypertension and 15 controls. In the cases of hypertension, massive cerebral hemorrhage was found in 4 cases and small and spotty hemorrhages with numerous infarcts of similar size in 5 cases. Single large infarcts occurred in 3 cases. He was impressed with the frequency of multiple miliary infarcts, which he found in 12 cases in basal ganglions, cortex, white matter, brain stem and cerebellum; they varied in size from 5 to 6 mm. across to minute softenings only seen with the aid of a microscope. These small lesions had been ascribed to vascular spasm by Westphal and Bär and by Spielmeyer [12] because no adjacent organic arterial lesion could be found. This was often Rosenberg's experience, but he found some infarcts adjoining thrombosed vessels. Rosenberg concluded that "in this study it was always possible to demonstrate regions of cerebral destruction where focal cerebral symptoms had been present during life, and in instances where the brain showed no destructive lesions the history revealed that episodic focal symptoms had not been present during life." He suggested from his anatomic studies that cerebral symptoms were of three kinds in malignant hypertension: (1) due to increased intracranial pressure (headache, vomiting, drowsiness), (2) due to multiple miliary cerebral lesions (a wide variety of transitory disturbances often without physical signs) and (3) due to large cerebral vascular accidents. Rosenberg's observations support the idea that attacks of transitory paralysis in hypertension are due to focal ischemia of the brain, but leave undecided the problem as to whether the ischemia is due to spasmodic or organic arterial obstruction, though in some cases the latter was clearly the cause.

Whether or not localized spasm of cerebral arteries occurs in the disease is not unimportant to the general conception of the mechanism of hypertension. It is extremely probable that raised arterial pressure is due to vasoconstriction, but the causal agent is not yet known. If the cerebral arteries in this disease do from time to time undergo vasoconstriction (*a*) so intense as to paralyze nervous activity in their distribution and (*b*) so localized that nutrition of the remainder of the brain is unimpaired, then it would follow from (*a*) that the agent has an intense constrictor action on the cerebral arteries and from (*b*) that the active substance can be released in significantly abnormal amounts at localized points within the cranial cavity. If the principle of the paucity of hypotheses is applied, the suggestion at once emerges that the agent causing hypertension is one produced within the cranial cavity. These implications of the hypothesis become all the more striking when it is added that in hypertension localized arterial constriction of similar degree is generally claimed in no other vascular territory except the eye. The implications need, however, be pressed no further, for it will be the function of this paper to show that the hypothesis is not only improbable but also unnecessary, and that it should therefore be discarded. That the hypothesis is improbable emerges from a consideration of the cerebral arteries and their behavior; that it is unnecessary is plain from the fact that precisely similar attacks may occur when a cerebral artery is occluded by an embolus.

7. Peabody, G. L.: Relation Between Arterial Disease and Visceral Changes, Tr. Am. A. Physicians **6**: 154, 1891.
8. Osler, W.: (a) Raynaud's Disease, Canad. M. A. J. **1**: 919, 1911; (b) The Cerebral Complications of Raynaud's Disease, Am. J. M. Sc. **112**: 522, 1896.
9. Westphal, K.: Pathogenesis of Apoplexy: Clinical Investigations, Deutsches Arch. f. klin. Med. **151**: 37, 1926.
10. Davison, C., and Brill, N. Q.: Essential Hypertension and Chronic Hypertensive Encephalopathy, Ann. Int. Med. **13**: 1766, 1939.
11. Rosenberg, E. F.: Brain in Malignant Hypertension, Arch. Int. Med. **68**: 545 (March) 1940.
12. (a) Westphal, K., and Bär, R.: Pathogenesis of Apoplexy, Deutsches Arch. f. klin. Med. **151**: 1, 1926. (b) Spielmeyer, W.: Vasomotorisch trophische Veränderungen bei Zerebraler Arteriosklerose, Monatschr. f. Psychiat. u. Neurol. **68**: 605, 1928.

THE CEREBRAL ARTERIES AND THEIR BEHAVIOR

Anatomists have long stressed that among the arteries of the body, the cerebral arteries are peculiar in the relative thinness of their wall (fig. 1). Baker [13] has shown that the cerebral arterioles are also peculiar in that their media is chiefly composed of callagen, muscle being sparse and in places absent. The cerebral arteries do not look like arteries that would show intense variations in caliber in response to constrictor stimuli, nor in fact do they delay. Thus repeated investigation [14] failed to demonstrate cerebral vasoconstriction after stimulation of the cervical sympathetic fibers until Forbes and his colleagues [15] developed their technic of direct measurement of pial arteries through a closed window in the skull. Even so the constriction of the pial arteries is small and insignificant as compared with arteries of the skin (fig. 2). Again epinephrine directly applied to the cerebral arteries constricts them feebly, but when epinephrine is injected intravenously this action is more than overcome by the rise of arterial pressure, so that the pial artery actually increases in size. Bouckaert and Heymans [16] have shown that the cerebral vessels do not participate in the generalized vasoconstriction evoked by a fall of pressure in the carotid sinus. The clear picture of the cerebral arteries that emerges from both anatomic and physiologic investigations is thus of feebly contractile arteries reacting weakly or not at all to vasoconstrictor agents. Clearly the hypothesis of local spasm of a cerebral artery intense enough to produce paralysis of nervous function and ultimately necrosis of cerebral tissue is not one to be adopted if a reasonable alternative can be put forward. Such an alternative does arise from a comparison of attacks of transient paralysis occurring in hypertension with those occurring in embolism of the cerebral arteries.

Fig. 1.—Transverse section (× approximately 84) through the wall of the radial artery and the middle cerebral artery of the same subject. This illustration was provided by Dr. Duniach, British Postgraduate Medical School, London.

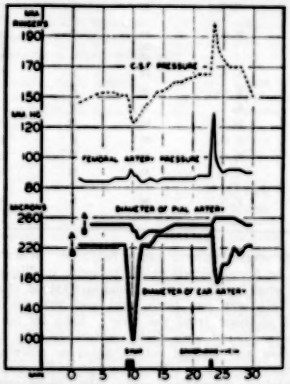

Fig. 2.—The lower two curves show the diameters of a pial artery and of an artery of the ear, measured in a monkey by direct observation. Stimulation of the cervical sympathetic constricted the pial artery by 2 per cent and the ear artery by 56 per cent. Intravenous administration of epinephrine dilated the pial artery by 4 per cent and constricted the ear artery by 26 per cent. (From Forbes, H. K.; Kinley, K. H., and Nason, G. I.: Arch. Neurol. and Psychiat. 30:937, 1933.)

HYPERTENSIVE ENCEPHALOPATHY AND CEREBRAL EMBOLISM COMPARED

Hypertensive Encephalopathy.—Chronic hypertensive encephalopathy characterized by transient motor or sensory paralysis of cerebral origin is not very common. I have records of only 11 cases seen during the last 15 years, and these are summarized in table 1. Cases have, however, been described by Volhard, by Wagener, Keith and Kernohan, by McAlpine and others [17] and the clinical facts are well known. Typically when the patient is in good health and engaged in his usual daily occupations, paralysis of a limb or of half of the body, asphasia, sensory loss or blindness of an eye or of half of a field of vision abruptly supervenes. Consciousness is usually not lost, but the patient may be confused or excited. The condition may last a few minutes or a few hours and then gradually passes off, leaving the patient apprehensive or tired but without signs of any focal disturbance of the central nervous system. Such is the typical attack as it has been described. But while such attacks by their dramatic character focus the attention of the investigator, it is a mistake to think that there is an abrupt dividing line between these brief and evanescent paralyses and those which clear more slowly and which may leave residual symptoms and signs of a permanent lesion of the central nervous system. In fact, in my own experience, summarized in table 1, there is a continuous series from attacks in which paralysis is brief and totally reversible to those in which paralysis persists for months or years to leave some permanent residuum. By general consent the latter are regarded as due to cerebral arterial thrombosis; the contention here presented is that the former are also. The following report presents an example of a patient who experienced a paralysis of long and one of brief duration.

Case 3.—J. C., an intelligent clerk of 41, was standing in a crowded underground train on Dec. 29, 1933, when his left arm and leg suddenly became weak. He did not lose consciousness or fall, but managed to stagger out of the train and walk 100

13. Baker, A. B.: Structure of Small Cerebral Arteries and Their Changes with Age, Am. J. Path. 13:453, 1937.

14. (a) Hill, L., and MacLeod, J. J. R.: Influence of Compressed Air and Oxygen on the Blood, J. Physiol. 30:394, 1900. (b) Roy, C. S., and Sherrington, C. S.: Reaction of Blood-Supply to Brain, ibid. 11:85, 1890. (c) Florey, H. W.: Microscopical Observations on Circulation of Blood in Cerebral Cortex, Brain 48:23, 1925.

15. (a) Forbes, H. S., and Wolff, H. G.: Cerebral Circulation, Arch. Neurol. & Psychiat. 29:1037 (June) 1933. (b) Forbes, H. S.; Finley, K. H., and Nason, G. I.: Cerebral Circulation; Action of Epinephrine on Pial Vessels; Action of Pituitary and Pitressin on Pial Vessels; Vasomotor Response in Pia and in Skin, ibid. 30:957 (Nov.) 1933.

16. Bouckaert, J. J., and Heymans, C.: Carotid Sinus Reflexes: Influence of Central Blood-Pressure and Blood Supply, J. Physiol. 70:409, 1933.

17. Volhard,[18] McAlpine,[3] Keith, N. M.; Wagener, H. P., and Kernohan, J. W.: Syndrome of Malignant Hypertension, Arch. Int. Med. 41:141, (Feb.) 1928.

yards (91.4 meters) to a friend's office, whence he was taken home to bed. During his walk he tended to fall to the left. Since this attack he had noticed difficulty in articulation, in managing his dentures and in using his left arm and leg. These disabilities had slowly been recovering when he was first examined by me on Jan. 2, 1934. He showed the typical picture of severe essential hypertension (arterial pressure 220 systolic and 150 diastolic, normal urine and urea concentration to 2.5 per cent, and moderate retinal arteriosclerosis). He had slight but definite weakness of the left side of the face, the left arm and the left leg of the upper motor neuron type, deviation of the tongue to the right, exaggerated tendon jerks in the left upper and lower limbs, and a left extensor plantar response. Sensation and fields of vision were normal. By January 26, only weakness of the left side of the face remained. Ten months later, while at work he suddenly felt dazed and a severe headache developed lasting five minutes only. At the same time his left hand suddenly felt numb and weak, recovering in about five minutes. But for the next half-hour he kept hitting the wrong keys on the typewriter. For the rest of the day he was excited and walked about as if in a dream. He was discharged the next day for his behavior. Three years later, on Sept. 6, 1937, he

The pain gradually reached a maximum at which it remained during the last hour of the march; he was short of breath and sweated profusely. At the end of the march he lay down, and the pain passed off in about fifteen minutes. Subsequently he often experienced sternal pain on exercise, relieved by rest, and he was discharged from the army in December 1943. He eventually obtained a clerical post, and apart from angina and occipital headache on waking remained in fair health until Dec. 20, 1946, when at 10 a. m. while sitting at his office desk he noticed that his lower lip on the right side was numb. He bit his lip to confirm this. Then the fingers of his right hand became numb, and he found that he could no longer write. He could neither form the letters nor put the words on paper in their correct order, though he knew what he wanted to say. He thought that there was no weakness of the right hand, but it was clumsy and movements were difficult. He went into the next office and found that he could not speak; he knew what he wanted to say but the words were jumbled and his colleagues accused him of being drunk. All these disturbances cleared up completely in about twenty minutes, and he was able to continue his work for the rest of the day. Shortly afterward his eyesight began to fail, and he came to the hospital. Examined on Feb. 3,

TABLE 1.—*Transient Motor or Sensory Paralysis of Cerebral Origin in Essential Hypertension*

Case	Patient	Age	Sex	Blood Pressure	Number of Attacks	Nature	Duration	Loss of Consciousness
1	J. T.	36	M	220/144	1	Hemiparesis, right; aphasia	20 min.	No
2	M. L.	47	F	200/140 200/140	1 1	Aphasia; paresis, arms Aphasia	1 hr. 1 hr.	No No
3	J. C.	41 42 45	M	220/130 220/130 220/130	1 1 1	Hemiparesis, left Paresis, hand, left Aphasia	2 mo. 5 min. 1 hr.	No No No
4	K. I.	37	F	230/140	1	Paresis, face and arm, right	3 days	No
5	E. C.	56	F	240/120	1	Hemiparesis, left; aphasia	days	No
6	L. L.	52	F	200/130	1	Hemianesthesia, right	days	No
7	H. G.	53	M	190/130	1	Hemiparesis, left	days	No
8	R. G.	65	F	220	1	Aphasia; paresis, face, right	7 days	No
9	L. C.	63	F	220/115	1	Paresis, arm, left	7 wk.	No
10	S. H.	41	M	220/160	1	Aphasia; hemiparesis, right Hemianesthesia, right	2 wk. Persists	No
11	E. S.	66	F	234/140	1	Paresis, arm and face, right Leg, right, 7 days later	1 mo. Persists	No

woke with severe bilateral frontal headache. When he reached his office he found himself unable to speak intelligently, though he knew what he wanted to say and understood what was said to him. He was sent home, and said that his speech had recovered an hour from the onset. Seen by me later that afternoon he showed some slight residual difficulty in speaking; he was slow and hesitant but presented no other signs in the central nervous system. In December 1937, cardiac asthma, Cheyne-Stokes respiration and early albuminuric retinitis developed. He died of acute pulmonary edema, having maintained a severe hypertension throughout. Necropsy showed changes characteristic of malignant hypertension. The arteries of the circle of Willis showed moderately severe atheroma. A lesion of the cerebral substance characterized by pigmentation and irregular linear and punctate pits was found extending inferiorly from the junction of the middle and posterior thirds of the putamen into the internal capsule superiorly, and having a maximum area of 9 by 7 mm. No other focal cerebral lesion was found.

The only other case which need be cited is the following, in which coronary thrombosis, proved at necropsy, was followed four years later by a spectacular attack of transient paralysis lasting twenty minutes and leaving no clinical sequelae; but a small cyst was found in the putamen at necropsy four months later.

CASE 1.—J. T., then a 32 year old sergeant in the 8th Army, had a sudden attack of severe pain over the lower part of the sternum while at a Christmas party in North Africa in 1942. He had to lie down, and the pain passed off after twenty minutes. He felt easily tired subsequently. In August 1943, while he was on a march in Palestine, pain developed over the sternum which spread across his chest and down the left arm.

1947 (now aged 36) he showed gross hypertension (230 systolic and 144 diastolic) in the malignant phase (bilateral albuminuric retinitis), gross enlargement of the heart with gallop rhythm, normal urine and renal function and no abnormal signs in the nervous system. The patient died of acute pulmonary edema on April 7, 1947 after adrenalectomy. Post mortem, the heart weighed 400 Gm., the left ventricle being 2 cm. thick; an old infarct was found on the endocardial surface of the anterior wall of the left ventricle near the base and involving the contiguous part of the interventricular septum; the corresponding branch of the left coronary artery was thrombosed, the remaining coronary arteries showing only slight atheroma. The brain showed only slight atheroma of the basal vessels and of the left and right middle cerebral arteries traced as far as the insula. A yellowish cyst, 3 mm. by 5 mm. by 3 mm., was found in the left putamen in the same vertical plane as the mammillary bodies.

Of the 11 patients whose cases are summarized in table 1, L. L., R. G. and S. H. (cases 6, 8 and 10) died out of hospital from apoplexy three years, one year and three months respectively after the attacks named in the table. The brain was examined post mortem in only cases 1, 2 and 3. All 3 patients died of malignant hypertension with severe arteriolar lesions, particularly of the kidney. Cases 1 and 3, already described, each showed a cyst of the putamen clearly ischemic in origin, though no evidence as to the nature of the arterial obstruction was obtained. In case 1 an old myocardial infarct due to arterial thrombosis was also found. Case 2 presented a large number of small yellowish brown cysts about 2 mm. in diameter scattered through the basal ganglions of both hemispheres

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and two similar areas in the left pons. These findings in general agree with the more numerous and detailed observations of Rosenberg in showing that focal ischemia has occurred in cases presenting transient paralytic attacks.

The cases here reported and those of others show clearly that in hypertension there is no sharp dividing line between paralyses of cerebral origin that are transient and those that clear more slowly leaving a residue, and that both kinds of attacks are associated with focal lesions of ischemic origin in the brain. It may reasonably be inferred further that the nature and duration of the attack will vary with the size and position of the ischemic lesions. A persistent disability is more likely to arise from large infarcts than from small, and from lesions leaving a final area of necrosis in tracts such as the internal capsule than from lesions involving the silent areas of the brain. Histologic evidence leaves the cause of these ischemic lesions uncertain; serial sections sometimes reveal thrombosis of an artery, sometimes not, and this is true whether the infarct is large or small. Two chief possibilities exist; the ischemia may be due to organic arterial obstruction, for example, by a thrombosis; or it may be due to spasm. The evidence provided by the occurrence of similar attacks in mitral stenosis and auricular fibrillation may now be considered.

TABLE 2.—*Cerebral Embolism in Mitral Stenosis and Auricular Fibrillation*

Case	Patient	Age	Sex	Heart	No. of Attacks	Nature	Duration	Loss of Consciousness
20	W. B.	46	M	Auricular fibrillation	1	Loss of vision, left eye	20 min.	No
13	A. H.	46	M	Mitral stenosis, auricular fibrillation	1	Hemiparesis, left; confusion	1 hr.	No
14	J. F.	30	M	Mitral stenosis, auricular fibrillation	1	Hemiplegia, left; confusion	1 hr.	No
15	W. M.	28	M	Mitral stenosis, auricular fibrillation	1	Paresis, hand, right; blind, left eye; aphasia	1 hr.	No
16	C. S.	15	F	Mitral stenosis, auricular fibrillation	1	Hemiplegia, right; aphasia	2 days	No
17	B. H.	39	F	Mitral stenosis	1	Hemiplegia, left	1 wk.	No
					1	Hemiplegia, right; aphasia	Persists	Yes
18	L. C.	61	F	Mitral stenosis, auricular fibrillation	6	Hemiparesis, left	1 hr.	No
					2	Hemiparesis, left	2 days	No
					1	Hemiparesis, left	2 mo.	No
19	B. T.	49	F	Mitral stenosis, auricular fibrillation	1	Hemiplegia, left	Months	No
20	G. W.	42	M	Mitral stenosis, auricular fibrillation	1	Hemiplegia, left	Residue at 2 mo.	No
21	D. G.	38	F	Mitral stenosis, auricular fibrillation	1	Hemiplegia, left	Residue at 4 mo.	No
22	J. J.	70	M	Auricular fibrillation	1	Hemiplegia, left	Died, 24 hr.	Yes

Cerebral Embolism.—For many years I have been struck by the close similarity between the type of hypertensive cerebral attack just described and attacks occurring in patients with mitral stenosis and auricular fibrillation but without hypertension. The cases that have come under my notice are summarized in table 2 and are briefly as follows:

CASE 12.—B. E., a laborer aged 56 suffering from auricular fibrillation without valvular disease and with normal blood pressure (150 systolic and 80 diastolic), was admitted in 1939 for attacks lasting one-half hour in which he became giddy and breathless (thought to be due to paroxysmal ventricular tachycardia). In June 1939, when straightening up after taking a plant out of a pot he suddenly noticed blindness in the left eye. He was able to stumble into the house and upstairs to bed, where after half an hour his sight recovered. He was giddy at the time but noticed no disturbance in arm or leg. Examined four months later, the retinal arteries were of equal size in the two eyes and no signs were observed in the central nervous system.

CASE 13.—A. N., a schoolmaster aged 52, had noticed irregularity of the heart since 1941. In 1942 while returning from watching a boxing match he noticed that he was walking badly and went into a public house to get a whisky. He could not get the money out of his pocket because his left hand was useless, and he could not talk. He was recognized, and some men in the public house carried him home in a hand chair; he was perfectly conscious and remembers clearly seeing the people pass by. When he reached home he was laid on a couch unable to move his left hand or left leg and unable to talk. He remained so for half an hour, and then quite abruptly and within a minute or two he found he could talk normally and move his limbs. He never had a similar attack before or since. Examination two years later showed mitral stenosis and auricular fibrillation but no abnormal signs in the central nervous system and a normal blood pressure.

CASE 14.—J. F., with mitral stenosis was known to have had auricular fibrillation since October 1942. In the evening of Oct. 30, 1943, just after a routine visit to his physician he felt dizzy on reaching home and lay down on a couch. He did not lose consciousness, but his wife noticed that he was confused and that the left side of his face and his left arm and leg were paralyzed. His nephew, a doctor who had just been my house physician, and his own physician were called and arrived thirty minutes later to find left hemiplegia and confusion of thought. The paralysis cleared gradually during the next thirty minutes, and after receiving "omnopon" (a proprietary mixture of opium alkaloids, papaveretum BPC) he slept with periodic breathing. In the morning he was still confused but was said to present no trace of paralysis. I examined him later in the day and found him still rather confused and with only the slightest weakness of the left upper limb and of movements of the left ankle. The tendon reflexes were brisk and equal and the plantar responses normal. By November 4 he had lost even these trivial signs. In May 1944, when I last heard from him, he had had no further attacks.

CASE 15.—W. M., an insurance clerk aged 28, had suffered from rheumatic heart disease with auricular fibrillation for many years but still traveled 20 miles (32.2 kilometers) by train to London each day to his work. In 1935 while at his office desk his right hand abruptly became weak and clumsy and he found himself unable to hit the keys on his typewriter. At the same time he found himself unable to see out of his left eye. He was quite sure of this, for he covered first his left eye and then his right eye with his left hand. He felt confused and was unable to speak clearly, he believed. The attack lasted about an hour and then passed off completely, but my notes do not say whether the end was sudden or gradual. I saw him three months later and found signs of mitral stenosis and auricular fibrillation with aneurysmal dilatation of the left auricle. There were no signs in the central nervous system, but unfortunately the fundi were not examined. I heard from Dr. D. Bedford, his physician, that he died of cardiac failure a few years later without further attacks. There was no necropsy.

CASE 16.—C. S., a girl of 15 years suffering from mitral stenosis and auricular fibrillation, was treated with quinidine and her rhythm restored to normal in 1927. In 1928 she was

readmitted to University College Hospital under Sir Thomas Lewis, with congestive failure and treated with digitalis. At 1:45 p. m. on Nov. 12, 1928, she was noticed to be throwing herself about, the right corner of her mouth was down and she was trying to make herself understood but could only repeat words such as "jing." She understood what was said to her and could answer yes or no. She exhibited facial weakness on the right side and a flaccid paralysis complete in the right arm and nearly complete in the right leg. The tendon reflexes were not obtained in either leg; the plantar responses were flexor on the left, extensor on the right. There was no loss of consciousness. At 5:30 p. m. she could talk well, and the weakness had passed off to a considerable extent. On November 13 she appeared a little drowsy but otherwise normal mentally. Slight weakness of the right side of the face and upper and lower limbs persisted, and the right plantar response was still extensor. On November 14 no weakness was found, but the plantar response was not tested. On November 15 the right plantar response was recorded as flexor. She was discharged on Feb. 6, 1929, still fibrillating but with no signs of failure or hemiplegia. She died in hospital of terminal bronchopneumonia on Jan. 6, 1932. Her brain was examined post mortem by Dr. R. T. Grant, who provided me with all her case notes. The brain, sliced horizontally, was normal except for a yellowish cyst, 14 mm. long, 4 mm. wide and 7 mm. deep, in the putamen of the left lenticular nucleus. To find the vascular lesion responsible for this cyst, the middle cerebral artery and its chief branches were opened up under the dissecting microscope; the arteries seemed normal. A block of tissue extending from the lesion to the base of the brain was cut in transverse serial section 10 microns thick. No lesion was found in any artery of the block.

Case 17.—A married woman of 30 was walking across the hall to her office one day in the autumn of 1939 when she felt queer and had to sit down. Onlookers thought she looked ill and sent for a physician, who sent her to Charing Cross Hospital; there she was kept for the afternoon and then sent home to bed. Her memory of the attack is that she felt hot and giddy but never lost consciousness; her face became drawn to the right and she talked queerly; her left leg dragged and her left arm was useless when she went to bed. On the first day she had difficulty in controlling her bladder. Her limbs recovered gradually, but she has since noticed that her left arm twitches and becomes useless for a few minutes when she is tired. She was admitted to the hospital in November 1941 with congestive cardiac failure, mitral stenosis with normal rhythm and normal arterial pressure (140 systolic and 100 diastolic). No abnormal signs were found in the central nervous system. She was treated with digitalis and discharged home. On July 21, 1942, her husband had found her normal on leaving home in the morning but unconscious on his return at night. She was admitted to the hospital in coma with stertorous respiration. The right side of her face was flabby and her right arm motionless, and both plantar responses were extensor; she was incontinent. She had congestive cardiac failure, but her rhythm was still normal. She slowly emerged from her coma, regaining control of the sphincter on July 25, and showing some recognition of her husband. She was discharged on Oct. 24, 1942, with a severe residual spastic paralysis of right arm and leg and weakness of the right face. She recognized what was said to her and could reply by a nod of the head, but her articulation was so imperfect that few could understand her.

Case 18.—L. C., a married woman of 41, was seen in 1941 when she had had ten normal pregnancies, the last six years previously. In 1936 she had an attack when she suddenly felt a buzzing in her head, the room seemed to go round and she fell to the floor without losing consciousness. When she tried to get up she found that she could not, for weakness of the left arm and leg. The left side of her face felt queer and she had difficulty in pronouncing her words properly. She recovered completely in an hour. During the next six years she had four further attacks similar to the first in which weakness of the left side lasted about an hour and three in which it lasted two or three days, but she had not lost consciousness in any. On Feb. 26, 1941, she had just come in from shopping when something "seemed to go click" in her head and she fell to the ground. Again there was no loss of consciousness and her left side was paralyzed. She could see normally but her mouth felt pulled over. The left leg recovered its power to some extent in the next few days, but when she was brought to the hospital six days after the attack she was found to have a spastic paralysis of the left arm, paresis of the left leg and weakness of the left side of the face of upper motor neuron type, and mitral stenosis with auricular fibrillation and a heart rate of 160 per minute. The plantar response was extensor on the left, flexor on the right. The arterial pressure was 144 systolic and 95 diastolic. Lumbar puncture on April 8 showed a clear colorless fluid not under pressure. By May 6 the left leg had recovered completely, but there was still slight weakness of the left side of the face and the left upper limb. In 1944 she had her eleventh confinement, before which she was admitted to hospital with congestive cardiac failure from which she made a good recovery. She was last seen in March 1946, when she had no signs of cardiac failure but was still fibrillating. She had had no further attacks and the signs in the central nervous system had disappeared.

Cases 19 and 20 will not be described, since these patients gave stories rather similar to that in case 21, without, however, having been so fully observed by me.

Case 21.—D. C., a spinster of 26 on Dec. 30, 1945, was kneeling down putting a dish in the oven when she felt queer and fell over backward, bumping her head. She called her cousin to help her because she could not get up. Her cousin stood her up, but she fell over into the fireplace. She could talk normally, but she had no use of her left arm, and her legs, particularly the left, were weak. She was quite clear in the head; she could understand what was said to her, could see well and had no vertigo. Thirty minutes later she was seen by Dr. Mandler, who found a left hemiplegia and sent her to the hospital. She was seen by my registrar, Dr. James, seven hours after the onset, when she showed incomplete paralysis of the left lower part of the face and complete flaccid paralysis of the left arm and leg, with diminished tendon jerks and a left extensor response. The eyes showed conjugate deviation to the right. Lumbar puncture the following day showed a clear fluid with no cells and 30 mg. of protein per hundred cubic centimeters at a pressure of 240 mm. There was slow recovery of power, but on April 9, 1946, the left arm still showed some weakness of the hand and fingers, while the left leg showed definite weakness, especially of the dorsiflexors of the ankle. The plantar responses were now both flexor.

Case 22.—J. J., a man of 76, was admitted to the hospital on April 30, 1944, with a history suggestive of a coronary thrombosis a few hours previously; he showed signs of acute pulmonary edema and of auricular fibrillation. He made a good recovery and was progressing favorably until, on May 7, 1944, while he was having breakfast, the right side of his face was seen to go weak and he became unconscious. A right hemiplegia with flaccid paralysis of the limbs, absent tendon jerks on the right and a right extensor response was found. He died the following day without recovering consciousness. Postmortem examination showed a recent thrombosis in the descending branch of the left coronary artery and a corresponding recent infarct of the heart. An embolus was found in the right middle cerebral artery which had produced an area of softening in the hemisphere about 3 inches (7.5 cm.) in diameter.

In mitral stenosis and auricular fibrillation the sudden development of ischemia affecting part or all of an organ is usually due to embolism of an artery, as operation[18] or postmortem examination shows, the embolus being expelled from the left auricle and lodging at the bifurcation of an artery or at the origin of a large branch where the caliber of the artery is abruptly reduced. It may therefore be assumed that the cerebral attacks summarized in table 2 were due to cerebral embolism. This was proved only for J. J. (case 22), who died twenty-four hours after the attack. The only other patient coming to necropsy, C. S. (case 16)

18. (a) Key, E.: Embolectomy for Embolic Disturbances, Acta chir. Scandinav. 54:339, 1922. (b) Jefferson, G.: Arterial Embolectomy, Brit. M. J. 2:1090, 1934.

showed no evidence of embolic arterial obstruction three years after the attack despite careful examination. Nevertheless no other cause can reasonably be suggested in this case, for she was only 15 years old, the main cerebral arteries were normal and she had no hypertension. The conclusion from this case is rather that present methods of examining the cerebral arteries do not usually reveal the cause of vascular obstruction unless this is very recent. The diagnosis of cerebral embolism is supported by the frequency with which the right side of the brain or eye (10 cases) was affected as compared with the left (4 cases), since the right carotid presents the more direct path. In concluding that embolism was the cause of the cerebral attacks of table 2 a reservation must be made of case 18, which was peculiar in that a total of eight attacks of left hemiparesis occurred, the last leaving a residue for two months. It is inconceivable that eight separate emboli were delivered to precisely the same small vascular territory and to that only. Other known causes such as epilepsy and tumor were excluded by the history and course, but in the absence of postmortem examination any explanation is pure speculation.

It is not surprising that manifestations of focal cerebral ischemia should begin suddenly when an embolus occludes a cerebral artery. What is surprising is that the manifestations should be so brief and clear so completely in so many cases. It is, of course, well recognized that the degree of nervous impairment resulting from an organic lesion of a cerebral artery is greatest soon after the lesion occurs and then gradually recedes and that this is due at least in part to a gradual decline in the volume of ischemic cerebral tissue. Three reasons have been given to account for this phenomenon; namely, that brain tissue around the ischemic area is initially compressed by hemorrhage or edema which is removed gradually, that collateral circulation opens and restores the blood supply to all or part of the territory originally ischemic and that the clot is recanalized and blood flow reestablished through the occluded artery. In the case of embolism a fourth factor may be added; namely, that the embolus is forced into a side branch allowing the main artery to transmit blood once more. Of these four possible causes two can be excluded on time relations alone. Paralysis developed so rapidly in these attacks and gained its full extent so quickly that edema of the brain around the lesion can be excluded as a significant factor in either the development or resolution of the clinical picture. Again, the rapid recovery clearly was not due to recanalization of clot. There remain, therefore, the possibilities of opening up of collateral circulation and the moving on of clot. Lewis, Rothschild and I [19] described briefly a case of transient paralysis of a limb in which clear evidence of the moving on of an embolus was obtained.[20] In at least 2 of the cases of table 2 this would seem to have occurred. Thus A. N. (case 13), an intelligent schoolmaster, stressed that the recovery from his paralysis was abrupt, being complete in at most a few minutes. This suggests strongly the sudden opening of an artery, as might happen if a clot in the middle cerebral artery had been forced into the mouth of a side branch, freeing the main artery abruptly. Again, the attack in case 15 was probably due to the lodging of an embolus in the left internal carotid artery at the origin of its ophthalmic branch. The clearing of vision and of the paresis can most easily be explained by the moving on of the clot, though it is remarkable that a clot of this size should have produced so little in the way of permanent disability. A similar phenomenon may have happened in case 12. But even in these cases the clot must have finally lodged in, and blocked, some artery. In the remaining cases there is nothing to suggest movement of an embolus, which can scarcely be expected always to occur. In case 16, the most fully observed, the resolution of the paralysis was gradual and the final area of necrosis small and limited to a small area, the putamen. In this case at least the area originally ischemic must have been much larger than the final necrosis and the recovery can only be explained satisfactorily on the gradual restoration of blood flow to the periphery of the lesion by the opening of collateral vessels.

The extent of anastomosis between different orders of cerebral arteries has long been a matter of controversy, arising in part at least from difference in technic. There is now abundant evidence that anastomotic channels exist. Beevor [21] showed that the territory supplied by the middle cerebral artery can be injected through the anterior or posterior cerebral arteries. Pfeifer, Campbell and others [22] have shown in human and cat's brains that the pial vessels, and to a less extent the basal vessels, anastomose at the capillary, arteriolar and arterial level in that order of frequency. Evans and McEachern [22d] have shown that bismuth, injected into the carotid of a monkey just after death, appears in the middle cerebral artery distal to an occluding clip applied to the artery just before death. The anatomic facts and the physiologic behavior of the vessels thus agree in suggesting that the recovery from a localized occlusion of a cerebral artery is at least in part due to restoration of the circulation through collateral channels.

It is clear from the case histories and from inspection of tables 1 and 2 that the cerebral attacks occurring in patients with mitral stenosis and auricular fibrillation are similar in kind and duration to those occurring in severe hypertension. In both there may be a sudden paralysis of cerebral origin which clears completely in an hour or so or clears more slowly leaving a prolonged or permanent disability. There is no clear division in either series between paralysis that is completely and quickly reversible and paralysis with a permanent residuum. In each series an attack that is entirely transient and one with a more permanent residue may occur in a single patient (e. g., cases 3 and 17). Finally in both series examination of the brain long after the attack reveals a small area of necrosis, probably ischemic in nature, near the cerebral area presumably involved in the attack. In 2 cases of hypertension (1 and 3) and 1 case of embolus (16) in which transient hemiparesis occurred, similar lesions were found in the putamen. Even in the embolic case serial sections failed to reveal the vascular occlusion to which the lesion originally owed its cause.

COMMENT

The close similarity clinically and pathologically between the attacks in the two conditions suggests a corresponding similarity in the underlying vascular

19. Lewis, T.; Pickering, G. W., and Rothschild, P.: Observations upon Muscular Pain in Intermittent Claudication, Heart **18**: 359, 1931.

20. Subsequent to publication the diagnosis was confirmed post mortem.

21. Beevor, C. E.: On the Distribution of the Different Arteries Supplying the Human Brain, Phil. Tr., London, S. B. **200**: 1, 1909.

22. (*a*) Pfeifer, R. A.: Die Angioarchitektonik der Grosshirnrinde, Berlin, Julius Springer, 1928; (*b*) Grundlegende Untersuchungen fur die Angioarchitektonik des menschlichen Gehirns, ibid. 1930. (*c*) Campbell, A. C. P.: Vascular Architecture of Cat's Brain, A. Research Nerv. & Ment. Dis., Proc. **18**: 69, 1938. (*d*) Evans, J. P., and McEachern, D.: Circulatory Changes in Cerebral Vascular Occlusion and in Cerebral Cicatrization, ibid. **18**: 379, 1938.

events. In cerebral embolism the onset of the attack is due to arterial obstruction, in this case by an embolus, and the resolution to restoration of circulation through the opening of collateral vessels. The suggestion is clear that the hypertensive cerebral attacks are likewise due to organic arterial obstruction, also of sudden development, and that their resolution is due to restoration of circulation through dilatation of collateral vessels. This is not a new suggestion. As long ago as 1880 Jackson [23] wrote, "Transient paralysis may be owing to a small clot or to softening from blocking of a small vessel."

The suggestion here made as to the cause of the cerebral attacks in chronic hypertension violates no cardinal principle in vascular physiology and is in harmony with the pathology of hypertensive disease. Thus it is well recognized that in hypertension an artery may suddenly become occluded by clot which forms usually on some preexistent cushion of intimal thickening. It is also known that in hypertension the arterial lumen may be occluded by hemorrhage into the arterial wall or by swelling of the arterial wall as in acute fibrinoid necrosis, but it is not yet known how suddenly these events take place. Any of these forms of closure taking place abruptly would account for the attacks just discussed and which are most frequently concerned can only be told by careful histologic examination of the brain shortly after an attack.

During the present century it has become fashionable to ascribe localized and reversible disturbances of circulation to vascular spasm; in other words, to a strong localized vasoconstriction. In some instances the agent concerned in producing this localized vascular response has been clear, and in these critical examination of the facts has substantiated the hypothesis. Examples are (*a*) acrocyanosis and certain varieties of Raynaud's disease in which the agent is cold, and (*b*) arterial spasm due to trauma of the arterial wall and adjacent tissues. In others it has not been apparent what local vasoconstrictor agent has been at work, and in many of these fuller investigation of the facts has revealed organic arterial occlusion as the essential pathologic event. This is true of other varieties of Raynaud's disease, such as that in which digital necrosis occurs suddenly and bilaterally and that associated with cervical rib.[24] It is true also of certain events associated with disease of the coronary arteries, which like the cerebral arteries were at one time regarded as end arteries. The recent studies of Blumgart, Schlesinger and Davis [25] have shown that occlusion of a coronary artery may produce myocardial infarction, but an artery may also be found blocked in subjects in whom heart disease has never been suspected and in whom the occlusion must therefore have produced no disturbances or only minor ones. The variation in the extent and duration of myocardial ischemia following coronary occlusion must clearly depend on the extent of the collateral circulation, as has been postulated in the case of the brain.

Of all vascular territories the brain is the least likely to show strong localized vasoconstriction, particularly when this is supposed to occur suddenly and without apparent cause. The present paper has shown that organic occlusion of a cerebral artery or arteriole is a more probable cause of the attacks in question. Arguing from the analogy of the coronary arteries, it seems not improbable that occlusion of cerebral arteries may be followed by a variety of phenomena, varying from the classical apoplexy with residual hemiplegia, through the attacks of transient paralysis here discussed, to disturbances so slight as to be recognizable with difficulty. A great deal remains to be done, particularly in the correlation of clinical studies, with the anatomic changes in the cerebral vessels as revealed by the most modern methods. Spasm of the cerebral arteries has been postulated also in migraine and epilepsy. In migraine evidence has been produced that headache is due to arterial dilatation, but the pathogenesis of the aura is still obscure and relevant facts are so few as to make discussion fruitless. The hypothesis that the epileptic attack is due to cerebral vascular spasm has now been very generally abandoned. Nevertheless, Penfield's [26] observations of intense constriction of the arteries of the exposed cortex following an epileptic attack induced by electrical stimulation stand, and are at present imperfectly explained, though it is to be noted that in animals both electrical and mechanical stimulation have produced intense constriction of the pial arteries.

SUMMARY

Hypertensive encephalopathy comprises at least two distinct clinical and pathologic conditions. In acute hypertension or chronic hypertension with recent exacerbation, attacks of headache, vomiting, convulsions and coma are generally due to acute edema of the brain; this edema is less likely to be caused by excessive constriction of the cerebral arteries, as is now commonly held, than by defective constriction, as Traube originally supposed.

In chronic hypertension attacks of localized sensory or motor paralysis of brief duration are probably not due to cerebral arterial spasm but to sudden organic arterial occlusion, for example by a thrombus. The speed and completeness of recovery from paralysis will depend on the size of the final infarct and on its position. The arguments for this hypothesis are: 1. The cerebral arteries have comparatively poorly developed muscular walls. 2. They constrict feebly to known vasoconstrictor agents. 3. In 11 patients with chronic hypertensive encephalopathy no sharp dividing line was found between attacks in which paralysis lasted only a few minutes and attacks from which complete recovery did not occur. 4. In 11 patients embolic occlusion of cerebral arteries produced attacks that were precisely similar in kind and range to those occurring in hypertension.

23. Jackson, J.H.: On a Case of Temporary Left Hemiplegia, Brain 3: 433, 1880.

24. Lewis, T., and Pickering, G. W.: Observations upon Maladies in Which Blood Supply to Digits Ceases Intermittently or Permanently, and upon Bilateral Gangrene or Digits, Clin. Sc. 1: 327, 1934.

25. Blumgart, H. L.; Schlesinger, J. J., and Davis, D.: Studies on Relation of Clinical Manifestations of Angina Pectoris, Coronary Thrombosis, and Myocardial Infarction to Pathologic Findings with Particular Reference to Significance of Collateral Circulation, Am. Heart J. 19: 1, 1940.

26. Penfield, W.: The Circulation of Epileptic Brain, A. Research Nerv. & Ment. Dis., Proc. 18: 605, 1938.

Amount of Oxygen in Blood.—Normally, 100 cc. of arterial blood contains about 21 cc. of oxygen. Under normal basal conditions, only about 5.5 cc., i.e., about 30 per cent, is removed from the blood as it passes through the capillaries. The remaining 15.5 cc. may be regarded as reserve oxygen which can be called on during exercise or other unusual states to prevent asphyxia of the tissues. The anemic patient, to the extent to which he relies on the mechanism of more complete oxygen abstraction, diminishes his reserve oxygen and sacrifices this factor of safety; the degree of sacrifice would depend on the severity of anemia.—Blumgart, Herrman L., and Altschule, Ward D.: *Blood-the Journal of Hematology*, April 1948.

REHABILITATION OF THE HEMIPLEGIC PATIENT

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Physical medicine for the rehabilitation of the hemiplegic patient is not a new innovation in the field of medicine. Types of treatment and various regimens have periodically been elaborated in medical publications in years past.[1] Unfortunately, however, as with many aspects of medicine, the widespread application and general appreciation of what can be offered to these patients has been largely deficient. In civilian practice expense has undoubtedly been a major factor in this deficient utilization of physical therapy. Lack of teaching of physical medicine in medical schools and the heretofore scarcity of properly trained technicians and medical specialists in the field have also contributed toward limiting the more general application of adequate rehabilitation.

The urgent demand in service hospitals during the recent war for rapid rehabilitation of sick and injured personnel provided the stimulus for the greatest use of physical medicine and its allied rehabilitation activities ever adopted generally. The results have been widely reported and have not only soundly established physical medicine in the armamentarium of the medical practitioner as the third phase of medicine but have assured its recognition as a separate and potent medical specialty.

With the exigencies of the war period abated and the great number of wounded persons largely rehabilitated, time is now being found to focus attention more definitely on the application of the more intensive regimens for rehabilitation in the treatment of various chronic disabilities. In this broadened application, perspective is governed to a large extent by experiences gained in wartime rehabilitation.

In one naval hospital such an intensive rehabilitation program has been in operation for hemiplegic patients in the past eight months. Prior to the institution of this program, there had been no concerted or continuous effort to provide a systematized regimen for restoring ambulation and independence to these patients. Consequently, at the start the problem was more complex because of chronicity and its attendant deformities, such as atrophy of disuse, apathy and general poor health among most of the patients. The program, nonetheless, was started for this group of patients. As new patients came under observation, they were included promptly in the regimen. This arrangement provided opportunity for critical comparison of results obtained in the two groups of hemiplegic patients: All were hospitalized patients under daily observation; hospitalization was continued as long as necessary without personal expense to the patients. Physical therapy, similarly, was available in the hospital as needed by the patients without consideration of expense.

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1. (*a*) Bilik, S. E.: Treatment of Hemiplegia, Arch. Phys. Therap. **18**: 495-502, 1937. (*b*) Coulter, J. S., in Principles and Practice of Physical Therapy, Hagerstown, Md., W. F. Prior Company, Inc., 1945, vol. 3, chap. 15, pp. 46-50. (*c*) Cecil, R. L.: Textbook of Medicine, ed. 6, Philadelphia, W. B. Saunders Company, 1944, pp. 1408-1419. (*d*) Schlesinger, N. S., in Piersol, G. M., and Bortz, E. L.: The Cyclopedia of Medicine, Surgery and Specialties, Philadelphia, F. A. Davis & Company, 1943, vol. 11, pp. 156-186. (*e*) Beckman, H.: Treatment in General Practice, ed. 5, Philadelphia, W. B. Saunders Company, 1945, pp. 743-746. (*f*) Bierman, W.: Hemiplegia, Am. J. Nursing **40**: 115-118, 1940. (*g*) Hobhouse, N.: Prognosis in Hemiplegia in Middle Life, Lancet **1**: 327-328, 1936. (*h*) Leavy, I. M.: Physical Therapeutics in Hemiplegia, Arch. Phys. Therap. **14**: 407-418, 1933.

TREATMENT

In rehabilitation of the hemiplegic patient, the objectives of physical medicine and the measures for directing therapy are twofold, namely, prophylactic and definitive.

During the acute phase of the patient's illness, treatment is solely medical, supplemented by intelligent nursing care.[2] Maintenance of cleanliness, frequent change of positions, insistence on good bed mechanics, sandbags or pillows being used if necessary, are all important in the prophylaxis against trophic changes in the skin and contracture deformities.

The program of rehabilitation is begun from two to four weeks after the onset of acute illness. Initial flaccid paralysis is usually followed within weeks by spasticity; the start of the rehabilitation regimen should precede the onset of this latter phase.

The initial program is prophylactic. Daily passive motion is carried out to prevent the formation of adhesions of the joints and the shortening of muscles, which would predispose to contractures and ultimate deformities. The tendencies toward adduction of the shoulders, flexion at the elbows with pronation of forearms, flexion and external rotation of the hips, flexion at the knee and extension and inversion of the foot are prevented by proper posture and by passive motions of normal range. Local application of heat and massage may be employed after the first week but are not indicated except in cases in which local pain is particularly disturbing or an obstacle to the performance of normal exercise of the joints. The use of Hubbard tanks for reeducation exercises and for early active exercises under water is valuable and is employed almost routinely in this early phase of the reconditioning program. These exercises may be given three to six times a week for thirty minutes each as an addition to the measures already mentioned.

As soon as voluntary motion is possible the patient starts active exercises in bed; these are done several times a day in increasing amounts so that atrophy of disuse may be kept at a minimum. Exercise routines have been well outlined in the literature.[3]

Definite efforts at reambulation should be started early. The period varies from two to eight weeks, but ambulation is physically feasible for the average patient within three to four weeks after his acute illness.

First, sitting in bed is carried out twice daily for several days to readjust the patient to an upright position. He then is allowed to support his weight by placing both feet on the floor in order to regain activity of normal standing reflexes and to relearn weight shifting and balance. After this has been practiced twice daily for several consecutive days, the patient is ready for the gymnasium.

Exercises in the gymnasium must be under the supervision of a physical therapist. In the beginning they consist only of mat exercises, e. g., straight leg raising, overhead extension of the arms, the unaffected arm being used to assist the affected one, abdominal exercises and extension of the back. For uniformity, these exercises are given for five minute periods with or without the assistance of a technician as needed by the individual patient. The exercises are increased in number as tolerated.

2. Prochazka, A.: Nursing Care in Hemiplegia, Am. J. Nursing **40**: 118-120, 1940.

3. Coulter,[1b] Prochazka.[2]

Stand-balance procedures are carried out daily, and the patient is graduated to a mechanical walker as quickly as possible. With the return and increase in muscle power over a period of weeks, he is then allowed to walk between parallel bars and finally to walk with canes. Supervision of gait is important, and patients are taught to practice reambulation procedures before mirrors, with conscious appreciation and correction of errors of which they are guilty.

New hazards are added one by one, and in the course of his rehabilitation the patient must master stair climbing, curb stepping, inclines, beds, toilets, chairs, dressing and undressing and achieve other accomplishments essential to his self sufficiency.

Ultimately it is desirable that canes and other mechanical appliances be discarded entirely. This is of course dependent largely on the degree of damage inflicted at the initial onset of illness and cannot always be done.

Regimens vary for each patient under treatment. Often the resistive exercises is indicated for rebuilding specifically affected muscles or muscle groups. In many instances of more demanding

Fig. 1.—Group therapy is a potent stimulus to the morale and cooperation of the patient.

general reconditioning devices such as stationary bicycles and rowing machines can and should be utilized.

Score card achievement sheets such as those devised for paraplegic patients in Veterans Administration centers [4] may be used as competitive aids to morale.

Group therapy (fig. 1) is important not only in conserving labor but in building morale and a healthy competitive spirit among patients. Exercising on mats in groups and walking in or before groups are invaluable stimuli to the maintenance of good morale and good perspective among these patients, who notoriously are prone to become morbidly introspective and emotional. The importance of this is emphasized when it is remembered that a patient's recovery is almost entirely dependent on his efforts and cooperation and only a small part is the result of supervision and direction. Unless determination and cooperation can be instilled and nurtured, rehabilitation is defeated from the start.

For patients with motor aphasia retraining in speech, carried on under the supervision of the hospital's aural rehabilitation center, is started early and is valuable in expediting and augmenting improvement of this impediment.

REPORT OF CASES

A total of 28 patients (table 1) with hemiplegia which was the result of cerebrovascular accidents were subjected, over an eight month period, to an intensive program of physical rehabilitation. The average age of these patients was 55.2 years. In 13 cases the hemiplegia was on the left side and in 15 on the right.

Chronic Cases.—Eighteen patients initially admitted to the program were chronically ill, having had vascular accidents three or more months previously. The average duration of illness was thirteen and a half months. None of these patients had been subjected to rehabilitation procedures, and all were in the hospital for domiciliary and nursing care. Three were able to stand with support, and the others were either totally confined to bed or were able to be in a wheel chair. All required assistance in getting in and out of bed, in using a toilet or bedpan and in propelling a wheel chair. Morale was extremely and consistently low; they were irritable, querulous and unhappy. After initiation of the program, which lasted an average of one hundred and eighteen and a half days and averaged 95.8 treatments per patient, 5 of the 18 patients were able to walk and were discharged. Reambulation was accomplished in an additional 7 cases. In 3 cases there was no improvement. In the remaining 3 there was slow improvement, which has not yet permitted independent ambulation.

TABLE 1.—*Results from Rehabilitation of Twenty-Eight Hemiplegic Patients*

Case	Age	Duration of Hemiplegia	Rehabilitation Period, Days	Number of Treatments	Results
			Chronic Cases		
1	37	19 mo.	106	116	Reambulation; discharged
2	59	14 mo.	169	87	Failure; mental deterioration
3	69	13 mo.	109	98	General systemic improvement only; no reambulation
4	57	6 mo.	186	147	Improved; progress continues
5	50	5 mo.	93	71	Reambulation; discharged
6	58	26 mo.	149	87	Reambulation
7	56	15 mo.	190	204	Reambulation
8	57	13 mo.	169	117	Reambulation
9	68	12 mo.	177	190	Reambulation (partial); discharged
10	50	48 mo.	69	94	Reambulation
11	52	15 mo.	23	17	Reambulation; discharged
12	56	15 mo.	186	136	Reambulation
13	47	16 mo.	169	127	Improved; progress continues
14	68	5 mo.	39	19	Reambulation
15	57	7 mo.	115	128	Reambulation
16	67	6 mo.	13	13	Failure; discontinued; mental deterioration
17	52	3 mo.	81	57	Reambulation; discharged
18	54	3 mo.	28	24	Failure; discontinued; mental deterioration
Av.	55.5	13.5 mo.	118.8	95.8	
			Fresh Cases		
1	58	2 wk.	16	14	Reambulation
2	56	3 wk.	39	24	Improved; progress continues; no reambulation yet
3	57	7 wk.	92	57	Reambulation
4	52	8 wk.	90	57	Reambulation
5	46	4 wk.	149	76	Reambulation; discharged
6	59	6 wk.	88	59	Reambulation
7	57	6 wk.	84	56	Reambulation; discharged
8	58	8 wk.	55	38	Reambulation; discharged
9	49	8 wk.	58	37	Reambulation; discharged
10	53	3 wk.	71	57	Reambulation; discharged
Av.	54.5	5.4 wk.	67.1	41.6	

CASE 1.—J. E. K., a 50 year old white man, was admitted to the hospital on Sept. 10, 1945, critically ill with hemiplegia of the right side which was the result of cerebral thrombosis. On his admission no history was elicited because of the presence of aphasia. Examination revealed complete hemiplegia of the right side, moist coarse rales with impaired resonance at the base of both lungs and a blood pressure of 128 systolic and 88 diastolic. There was auricullar fibrillation, with a deficient pulse and weak heart sounds; the liver was palpable 3 fingerbreadths below the right costal margin. Hyperactive deep tendon reflexes were present on the right side, and there was a positive Hoffman sign and an equivocal Babinski sign. The diagnosis on admission was (1) severe cerebrovascular injury, possibly on an embolic basis in view of the auricullar fibrillation and involving an extensive

4. "What's My Score?" Veterans Administration Pamphlet 10-10, 1946, p. 36.

area of the brain (motor area, left parietal lobe and the internal capsule on the left) and (2) auricullar fibrillation on the basis of arteriosclerotic heart disease.

The patient improved on supportive therapy, and by October 10 he was able to be out of bed occasionally in a wheel chair. There was slow gradual return of function in the upper part of the right leg, but he was unable to walk or stand and required lifting. As a result of inactivity there developed an external rotational contracture of the right hip and a flexion contracture of the right knee. By July of 1946 there was considerable orthostatic edema of both legs, attributable to long hours of inactivity. During this time he received only spasmodic physical therapy.

On Oct. 22, 1946, a rehabilitation program was begun. At this time the patient was unable to stand or to get to and from his wheel chair. There was an external rotational contracture of the right hip and a 45 degree flexion contracture of the right

Fig. 2.—The patient in case 1 had been incapacitated for fifteen months prior to the start of the program of rehabilitation; after one hundred and eighty-six days he was self sufficient.

knee. Abduction of the right shoulder was limited to 90 degrees; muscle function in the right upper extremity was good throughout. The right leg was edematous, and muscle function was fair. Daily reconditioning exercises were begun in the gymnasium. In addition, forceful stretching exercises were carried out twice daily for the contractures. Heat and massage were applied concurrently in the department of physical therapy to minimize secondary soreness and pain. As the knee range increased over a period of weeks to full extension, reambulation was begun. Weakness of the right quadriceps muscle from disuse precluded immediate full weight bearing, and a brace to stabilize the knee was needed for several weeks until the muscle had gained sufficient strength through resistive exercises to enable the patient to support himself. Progress was continuous. One hundred and sixty-nine days after the start of reconditioning the patient was able to walk with the aid of two canes and without braces. He is capable of getting in and out of a chair alone, and of getting to and from a toilet. His gait is slow, but it is sure. The motor aphasia has persisted in degree, but there has been sufficient improvement to permit of meager conversation. There are no residual contractures. The patient is self sufficient.

Case 2 (fig. 2).—L. U., a 54 year old white man, was admitted to the hospital on July 12, 1945, with partial spastic paralysis of the left upper extremity and complete flaccid paralysis of the left lower extremity.

In August 1944 the patient first noticed weakness of the first, fourth and fifth fingers of the left hand after a sudden spell of dizziness and fainting; this was followed by an increasing weakness of the left arm and progressive inability to approximate the fingers of the left hand or to perform fine movements of the fingers. Because of the persistence of this weakness he was admitted to the hospital in January 1945 for two weeks' investigation. His systolic blood pressure at this time was recorded as 200 mm. of mercury; diastolic pressure was not recorded. A diagnosis of hypertension with hemiplegia was made at this time.

In March of the same year the patient entered a civilian hospital for further investigation of his disability. Myelograms at this time failed to demonstrate any evidence of a space-consuming lesion in the skull or in the cervical region of the spine; some communicating hydrocephalus was seen. It was noted at this time that the patient was depressed and antagonistic and that he was unwilling to help himself and had assumed a defeatist attitude. He was examined psychiatrically, and it was advised that therapy be directed toward getting him to accept whatever disability he had and to refrain from giving up all his activities by trying to compensate by increased dexterity of his other arm and hand. For about six weeks he was given physical therapy until he was discharged to his home.

On July 9, 1945, the patient lost control of his left foot, and by the next day flaccid paralysis of the entire left lower extremity had developed. On readmission to the hospital on July 12 there was complete hemiplegia of the left side. The blood pressure was 170 systolic and 90 diastolic. Examination of the fundi revealed moderate arteriosclerotic changes, without hemorrhage or exudate. There were hyperactive deep tendon reflexes on the left side, with ankle and patellar clonus, positive Hoffmann and Rossolimo signs and absent abdominal reflexes. It was felt that hypertensive arteriosclerotic disease was the basis for the hemiplegia. In the course of the next fifteen months the patient was subjected spasmodically to physiotherapeutic measures including hydrotherapy, application of luminous heat, massage and occasional ambulation exercises in a walker. There was slight improvement, but during this time there was never inaugurated an intensive systematized regimen for his rehabilitation.

On Oct. 31, 1946, an active program of reconditioning and reambulation was started. At this time the patient could hobble with a cane if assisted; without assistance, he could not stand. One hundred and eighty-six days after the start of the rehabilitation program he had progressed so that he could wheel his wheel chair, get in and out of it unassisted, walk alone with the use of one cane, ascend and descend stairs and get to and from a toilet and in and out of bed. From a standpoint of personal self sufficiency he is independent. There is residual spasticity of both left extremities, with little function in the upper one, but good power and control of the lower.

Fresh Cases.—In 10 of the cases in the series of 28 the cerebrovascular accidents had occurred less than three months prior to initiation of rehabilitation. These were classified as fresh cases. The average interim between the onset of acute illness and the admission to the program was 5.4 weeks. After an average of 67.1 days, during which time they received an average of 41.6 treatments, 9 of the 10 patients were restored to an ambulatory status. Five of this group of 9 were discharged from the hospital. In the tenth case there was improvement, but after seven weeks of treatment the patient was not yet able to walk. Treatment is being continued, and the prognosis is good.

Case 3 (fig. 3.)—D. P., a 57 year old white man, was admitted to the hospital on Oct. 31, 1946, with trichophytosis of the left foot. The patient was known to have diabetes. The infection in the foot healed under treatment, and the diabetes remained well controlled.

On Nov. 20, while still in the hospital, the patient suffered a cerebrovascular accident, which resulted in complete hemiplegia of the left side. For two days he was semistuporous. On the second day it was noted that he could move his left leg slightly. Within ten days the acute phase subsided and spastic hemiplegia of the left side remained. On November 30 physical therapy was begun. The patient received daily treatments in the Hubbard

tank, with underwater reeducation of muscles, active exercise and normal range exercises to prevent muscle shortening and contracture secondary to the spasticity. On December 13 hydrotherapy was discontinued and active efforts at reambulation were begun. He was taught standing, balance and weight shifting, and he was then graduated to mat exercising. Within the next month he was using a walker, then parallel bars and finally a single cane. He mastered stair climbing, curb stepping, inclines, beds and chairs, and by March 7, 1947, eighty-four days after the start of his rehabilitation, he was completely self sufficient and was discharged from the hospital. On his discharge there was still complete paralysis of the left upper extremity and spasticity of the lower extremity, but muscle power and control were excellent.

CASE 4.—W. T., a 49 year old white man, was admitted to the hospital on Feb. 1, 1947, acutely ill from a cerebrovascular accident.

For five years prior to his admission the patient had had hypertension and had been under the care of his physician. Two weeks prior to his admission he began having blackout spells and was confined to bed. One week later there developed headaches, progressive motor aphasia and weakness of the right extremities.

Fig. 3.—The patient in case 3 was initiated early into the program, was graduated to active reconditioning within six weeks after the occurrence of the cardiovascular accident and was discharged as rehabilitated after eighty-four days.

On admission to the hospital the patient was acutely ill, dyspneic and stuporous. His blood pressure was 165 systolic and 110 diastolic. There were diffuse coarse rales throughout both pulmonary fields and complete hemiplegia of the right side, with increased deep tendon reflexes and a positive Babinski sign on this side. The patient was aphasic. During the next month he improved slowly. On March 3 rehabilitation was started. Within the ensuing thirty-eight days he was completely ambulant, without need of canes or other supports. There was good return of function in both right extremities. The aphasia improved so that he could carry on a laconic but intelligible conversation. He was discharged, ambulatory and self sufficient, on April 26.

COMMENT

In the initiation of an active regimen for patients with proved defective vascular systems, there was naturally considerable apprehension as to the limits of exercise which might safely be tolerated. Accordingly, an effort was made to evaluate the demands of the exercises to be employed (table 2). Individual patients were subjected to the exercises, and the blood pressure and pulse were checked just prior to and immediately after each procedure. Only one exercise a day was done by each patient, and a rest period of five minutes preceded each. Similarly, combined continuous exercises for periods of twenty minutes were performed by the patients and the blood pressure and pulse recorded. It was surprising to note the apparently excellent tolerance of these procedures by all patients and the relatively minor effect on their vascular mechanisms. However, despite the tolerance of even the combined twenty minute exercises, patients were never subjected to exercise for a period of this length in the gymnasium but were permitted to rest between procedures. No difficulties were encountered among the 28 patients at any time as a result of the reconditioning procedures.

Cooperation on the part of the patient, fostered by his desire to regain his independence, is the greatest factor in assuring the success of his ultimate rehabilitation. Normally the hemiplegic patient's conception of his prognosis is a gloomy one based on lay associations and observations. Hobhouse [12] has pointed out, however, that if the medical attendant has clear ideas on the subject, is aware that the outlook for uncomplicated hemiplegia is potentially good and can convince the patient of this fact he will appreciably improve the prospect. Fortunately, morale is rather easily stimulated; this is a contrast to younger patients wounded in war whose youth, immature perspective and undue desire to compensate at times rendered them less cooperative. Because of a mature perspective, the hemiplegic patient appreciates more fully the limitations imposed by his disability and is accordingly more earnest in his desire to recoup his loss.

The extent of ultimate functional return is dependent primarily on the degree of damage wrought by the vascular accident. Secondarily, however, the expeditious and intelligent direction of the program of rehabilitation markedly augments the favorable outlook. The treated patient always shows better results than the untreated patient, and delay modifies in direct degree the success of the final result.

By and large, the job is one of salvaging all innervated muscle through reeducation and the building of muscular power to a maximum functional level with remedial exercises.

The least return of function occurs always in the fingers and wrist, with greater return proximally toward the shoulder. In a large percentage of cases there is minimal functional return throughout the upper extremity. The greatest return occurs always in the proximal part of the lower extremity, with loss graduated distally. In no case in this series has loss of function in the lower extremity been complete or sufficiently extensive to preclude the possibility of reambulation. In the 3 chronic cases in which reambulation was not effected, the hindering factor was mental deterioration and not paralysis. Hobhouse [12] expressed the belief that the greater return of function in the lower extremity as compared with the upper is the result of the fact that the lower extremities must be used together to be of functional value whereas this is not true of the upper extremities. He further stated that the pathologic damage to the innervation productive of the hemiplegia is no greater in the upper extremity than in the lower but that the relative defi-

ciency in return of function in the arm is a manifestation of disuse. He advocated early use of the upper extremity, even to the extent at times of putting the unaffected arm in a cast, and reports good results in his cases. The frequently poor return of function in upper extremities in this series is therefore possibly due to inadequate therapy.

In a comparison of the results of treatment among the 18 chronic cases and the 10 recent cases of hemiplegia, it is of interest to note that the time necessary to bring about reambulation in the recent cases was roughly half as long as that required in the chronic cases. It is also noteworthy that no failure occurred when reconditioning was begun promptly while among the chronic cases no progress was made in 3 and in 3 others progress was slow despite protracted periods of treatment. Reambulation was brought about in 90 per cent of the cases observed early as compared with 66 per cent of the chronic cases. This may not be wholly a valid comparison, since among recent cases a certain percentage of spontaneous recoveries should normally be expected. On the other hand, the absence of failure cannot be minimized.

sufficiency it must be considered satisfactory. A patient may continue to need one or two canes indefinitely. Circumduction types of walking have been condemned by many writers. However they often constitute the patient's maximum adeptness and as such should be accepted as satisfactory if self sufficiency is thus attained. The same principle applies to stair climbing, dressing and undressing, getting into and out of a bed and to and from a toilet and the numerous other hazards which must be mastered in the process of rehabilitation.

Among the chronic cases, in which the period of disability averaged thirteen and a half months when rehabilitation was begun, the immediate major problems were the contracture deformities and the atrophy of disuse. Initially the contractures had to be corrected through stretching exercises. To be effective stretching must be forceful and at least temporarily painful, and it must be done regularly several times daily. Various physiotherapeutic measures such as heat, diathermy, hydrotherapy and massage are valuable adjuncts in minimizing consequent soreness. The most commonly encountered deformities in this series were those

TABLE 2.—*Cardiovascular Responses to Exercises by Hemiplegic Patients**

Patient		Leg Raising Exercises, 5 Minutes		Arm Extension Exercises, 5 Minutes		Back Extension Exercises, 5 Minutes		"Sit-Up" Exercises, 5 Minutes		Combined Exercises, 20 Minutes		Walking, 5 Minutes	
		Blood Pressure	Pulse	Blood Pressure	Pulse	Blood Pressure	Pulse	Blood Pressure	Pulse	Blood Pressure	Pulse	Blood Pressure	Pulse
C. G.	Before	132/ 80	84	142/ 84	92	122/ 82	84	132/ 82	86	122/ 72	80	.....	..
	After	144/ 84	96	150/ 96	104	134/ 90	102	144/ 79	100	132/ 74	86	.....	..
L. P.	Before	174/128	84	160/128	86	160/126	80	170/122	84	160/126	82	170/128	98
	After	196/132	96	182/126	94	192/132	106	192/136	94	166/128	96	178/132	109
L. U.	Before	160/100	88	150/ 98	80	152/ 88	78	150/ 98	80	146/ 80	86	144/ 86	94
	After	184/104	88	158/100	84	154/ 88	80	158/100	84	160/ 92	94	154/ 86	98
H. L.	Before	126/ 68	84	122/ 80	84	126/ 88	80	122/ 86	80	120/ 76	80	122/ 80	88
	After	134/ 92	96	130/ 84	86	132/ 90	80	126/ 68	84	132/ 80	82	134/ 86	96
J. D.	Before	134/ 82	80	134/ 76	92	140/ 90	92	138/ 82	86	138/ 76	78	138/ 86	92
	After	140/ 80	84	136/ 78	98	142/ 92	96	142/ 82	100	136/ 82	90	148/ 90	92
E. M.	Before	152/ 78	98	152/ 86	84	154/ 80	84	150/ 90	92	152/ 68	86	154/ 70	92
	After	158/ 80	88	170/ 88	92	160/ 84	100	160/ 90	100	160/ 84	92	160/ 90	108
P. O.	Before	122/ 82	92	.....	..	.....	..	.....	..	.....	..	.....	..
	After	134/ 86	100	.....	..	.....	..	.....	..	.....	..	.....	..
F. C.	Before	114/ 76	86	96/ 62	80	112/ 78	84	104/ 72	84	112/ 70	80	100/ 64	84
	After	120/ 80	92	110/ 74	88	114/ 80	84	104/ 72	84	110/ 74	92	114/ 74	100
J. B.	Before	100/ 70	80	110/ 58	80	110/ 58	88	104/ 68	80	.....	..	.....	..
	After	106/ 70	88	120/ 70	88	110/ 70	90	106/ 70	88	.....	..	.....	..
W. T.	Before	104/ 86	78	100/102	80	.....	..	104/ 98	80	.....	..	.....	..
	After	120/ 94	84	178/110	92	.....	..	144/112	94	.....	..	.....	..
W. W.	Before	140/ 92	84	138/ 90	88	144/ 98	100	134/ 92	96	140/100	84	130/ 90	84
	After	150/ 98	88	154/100	96	160/108	108	138/ 90	100	150/ 96	90	130/ 90	88

* All procedures were preceded by a five minute rest period.

Among the chronic cases there were a few in which reambulation was accomplished relatively soon after the start of reconditioning. This can be attributed to (1) a less degree of initial neurologic damage and/or (2) greater activity and therefore greater personal rehabilitation by the individual patient.

In directing the physical reconditioning of the hemiplegic patient, self sufficiency is the basic objective desired and adeptness a secondary consideration to be striven for but not insisted on. Training in posture and gait and the prevention of bad habits are important and must be closely guided. When there has been minimal permanent damage, a rhythmic and coordinated gait is completely possible and attainable through careful training. In a great many cases, however, ambulation is really "self propulsion" rather than rhythmic walking. This "propulsion" may well be the maximum that is possible in the face of the residual damage, and in such cases so long as it meets the criterion for self

secondary to contractures of the pectoral hip external rotator, hamstring and gastrocnemius muscles.

Generally there are few indications for the use of braces. Caliper types of braces are of value in the maintenance of progress gained by stretching exercises in cases in which there are contractures. Foot-drop supports in the form of figure-of-8 straps or spring dropped-foot braces are indicated in cases in which gross distortion of gait may be benefitted or in cases in which weakness of the ankle permits outward rolling of the foot with weight bearing. Occasionally when there is noted weakness of the quadriceps muscle it is helpful to employ locked knee braces to expedite reambulation; these braces are retained only until the strength of the quadriceps has been rebuilt through concurrent resistive exercises.

When there is poor return of function in an upper extremity, the orthostatic pull of the flail arm often is productive of pain in the shoulder. Local physiothera-

peutic measures are of help. The use of a supportive sling may become necessary, but this is undesirable because immobilization not only retards return of function but constitutes an additional hazard for the patient.

The use of transcranial diathermy[5] and various electrical currents[6] has not seemed warranted from the reports in the literature. Except for therapeutic exercise, the prolonged and usually empiric use of physiotherapeutic measures is rarely indicated. Too often injudicious use constitutes abuse and effects only a diversion of attention from the full use of intelligently administered therapeutic exercise, which is the specific agent in accomplishing the patient's rehabilitation.

Neostigmine was given to many patients with spasticity; the results obtained were inconsistent. In some cases it appears to provide relief of pain, and therefore it is worthy of trial.

Retraining in speech has been of value to aphasic patients. Ideally this should be done by a speech therapist. However it has proved satisfactory to have the program carried on by volunteer hospital workers under the direction and supervision of a therapist, an arrangement necessitated by the local shortage of trained speech therapists.

SUMMARY

1. Twenty-eight patients with hemiplegia were subjected to an intensive program of reconditioning and rehabilitation. Eighteen of these patients had become chronically incapacitated since their cerebrovascular accidents, which had occurred on an average of thirteen and a half months prior to initiation of rehabilitation. The illness in the remaining 10 patients was of relatively recent onset, since they had sustained their cerebrovascular accidents on an average of 5.4 weeks and not longer than eight weeks prior to the start of rehabilitation.

2. In 66 per cent of the chronic cases reambulation was accomplished after an average period of one hundred and eighteen and a half days. Improvement had occurred in an additional 17 per cent. In the remaining 17 per cent no benefits were obtained because of mental deterioration and emotional instability of a degree which precluded adequate cooperation.

3. In 90 per cent of the fresh cases reambulation was accomplished after an average period of 67.1 days. Improvement occurred in the remaining 10 per cent. Among this group there were no failures.

CONCLUSION

The early, intensive and intelligent use of physical medicine, with emphasis on therapeutic reconditioning exercises, assures a potentially good prognosis in the rehabilitation of patients with uncomplicated hemiplegia.

5. Martucci, A. A.; Hadden, S. B., and McGlone, B.: Treatment of Hemiplegia, Arch. Phys. Therap. 15:734-738, 1934. Wolf, H. F.: Treatment of Old and Fresh Cases of Hemiplegia and Poliomyelitis by Physical Therapy, M. Rec. 153:263-265, 1941.

6. Beckman,[a] Bierman,[b] Leavy.[b]

The Red Cells are Non-Conductors.—The erythrocyte constitutes an almost perfect non-conductor of electrical current, in which characteristic it is almost unique among tissues. Stewart, Cher-Blom, Wilson and others have utilized this characteristic to make possible the determination of the hematocrit and mean cell volume by electrical techniques-Hirsch, Fred G.; Wood, Lloyd A.; Ballard, William C.; Frey, Constance, and Wright, Irving S., from an address given April 29 at the Clinical Research Meeting of the New York Academy of Medicine.

REVASCULARIZATION OF HEART BY GRAFT OF SYSTEMIC ARTERY INTO CORONARY SINUS

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The first experiments to improve the arterial circulation to the heart were carried out by one of us (Claude S. Beck) in 1932. At that time the idea of improving coronary circulation by operative methods was a radical departure from established medical thought. A serious study of this subject was undertaken and several thousand operations were done on dogs during the next ten years. The results of these studies cannot be given here, but a general statement can be made to the effect that the circulation to the heart was improved by operative methods.[1] The degree of benefit produced by operation was measured by mortality after ligation of a major coronary artery in an operative group as compared to that in a normal control group. The size of the infarct following ligation of a coronary artery was also an index of benefit. That the heart was protected by operative methods was shown by a reduction in mortality of 50 per cent after ligation of a major coronary artery. Also the infarct was smaller in the operative group than in the control group. In some specimens an infarct did not develop after the descending ramus of the left coronary artery was ligated. In a normal heart an infarct always developed after ligation of this artery provided the animal survived the ligation. Thirty-seven patients with severe coronary artery disease were operated on. The results obtained after operation were beneficial. The clinical results corresponded with the results obtained in the experimental studies.[2]

In this work revascularization of the heart was produced in two ways. One was by the production of inflammation on the surface of the heart which in time led to the development of anastomoses between coronary arteries. These intercoronary communications brought about a more equitable distribution of blood in the myocardium and aided in the prevention of trigger zones in the heart which so frequently are responsible for ventricular fibrillation and death. The second method for improving blood supply was by grafting vascularized tissues on the heart with the expecta-

From the Department of Surgery, Western Reserve University, and the University Hospitals. This work was aided by grant R. G. 399 of the National Institute of Health, United States Public Health Service.

1. (a) Beck, C. S., and Tichy, V. R.: Production of Collateral Circulation to the Heart; Experimental Study, Am. Heart J. 10: 849 (Oct.) 1935. (b) Beck, C. S.: Principles Underlying the Operative Approach to the Treatment of Myocardial Ischemia, Ann. Surg. 118: 788 (Nov.) 1943. (c) Stanton, E. J.; Schildt, P., and Beck, C. S.: The Effect of Abrasion of the Surface of the Heart upon Intercoronary Communications, Am. Heart J. 22: 529 (Oct.) 1941. (d) Schildt, P.; Stanton, E. and Beck, C. S.: Communications Between the Coronary Arteries Produced by the Application of Inflammatory Agents to the Surface of the Heart, Ann. Surg. 118: 34 (July) 1943.

2. Feil, H.: Clinical Appraisal of the Beck Operation, Ann. Surg. 118: 807 (Nov.) 1943.

tion that blood vessels would grow across from the graft to the heart.

Further application of this work would have been carried out on patients between the years 1942 and 1945 had it not been for the war. During this period, however, a new approach to the problem of revascularization of the heart was beginning to come into existence. This development is the subject of this report.

In 1937 Gross, Blum and Silverman[3] reported an important research on the coronary sinus in dogs. These authors ligated or partially occluded the sinus and found that blood escaped from the heart into the four chambers of the heart. In their hands the mortality following this ligation was 42 per cent. They found that ligation of the sinus produced extensive and abundant dilatation of the intramyocardial collateral channels. Ligation of the sinus was advocated by them as a method of treatment for occlusion of a coronary artery. Physiologic studies were carried out on the sinus by several investigators[4] and the conclusions in general were less favorable than those of Gross and his associates concerning ligation of the sinus for coronary artery disease. Gregg and Dewald found that the pressure in the coronary sinus rose immediately after ligation to the level of aortic pressure. They found the contour and time relations of the venous pressure curves to resemble closely the curves obtained from the coronary artery. Thornton and Gregg studied the problem after the coronary sinus had been occluded thirty days. They found that the pressure in the sinus had practically returned to normal levels. No doubt the channels within the myocardium opened so that blood could escape more readily into the cavities of the heart.

In 1941 Beck and Mako[5] repeated the experiments of Gross, Blum and Silverman. They reduced the mortality of occlusion of the coronary sinus to about 2 per cent and found that occlusion of the sinus had some beneficial effect against occlusion of the descending ramus of the left coronary artery. They did not believe the benefit was great enough for application to patients.

While this study was in progress a query was made in our research laboratory to one of us (C.S.B.) by J. T. Roberts concerning the possibility of making an arteriovenous fistula in the heart. In 1943 Roberts, Browne and Roberts[6] reported on 14 dogs in which arterial blood was brought to the myocardium by a glass cannula connecting the coronary sinus with the brachiocephalic, subclavian or innominate artery. The coronary vein became distended, pulsatile and arterial in color. These dogs survived under conditions of acute experiments from 10 minutes to 26 hours even after ligation of coronary arteries. These authors stated that examination of myocardium revealed a complete injection of the capillaries after dye was injected into the coronary sinus.

In 1945 Blalock and Taussig[7] reported on the treatment of the tetralogy of Fallot by anastomosis of subclavian artery to pulmonary artery. Independently Gross[8] and Crafoord[9] resected a segment of aorta for coarctation and Clagett[10] transplanted subclavian artery into aorta beyond the constricted segment of aorta. Fauteux[11] reported on his operation for sclerosis of the coronary arteries in 15 patients. This operation involved ligation of the magna cordis vein and Fauteux showed that the human heart could tolerate occlusion of this vein. An additional aid in our work was the "vitallium" cannula of Blakemore and Lord.[12] Although this cannula was not successful in our work, it served a purpose in getting us started. The clamp devised by Potts, Smith and Gibson[13] for anastomosis between aorta and pulmonary artery is being used by us to graft a new branch from aorta to coronary sinus. These advances in surgery--and no doubt there are others that have not been mentioned—have contributed their part to the work reported here.

TECHNICAL DEVELOPMENT OF THE OPERATION

This study was begun Feb. 6, 1946. During the following two years approximately seven hundred operations were done on 350 dogs. By April 20 the first patent anastomosis was obtained after operating on 67 dogs, but this anastomosis, like many others that followed,

3. Gross, L.; Blum, L., and Silverman, G.: Experimental Attempts to Increase Blood Supply to the Dog's Heart by Means of Coronary Sinus Occlusion, J. Exper. Med. 65: 91 (Jan.) 1937.

4. Katz, L. N.; Jochim, K., and Bohning, A.: Effect of Extravascular Support of Ventricles on Flow in Coronary Vessels, Am. J. Physiol. 122: 236 (April) 1938. Gregg, D. E., and Dewald, D.: Immediate Effects of the Occlusion of the Coronary Veins on Collateral Blood Flow in the Coronary Arteries, ibid. 124: 435 (Nov.) 1938; Immediate Effects of Coronary Sinus Ligation on Dynamics of Coronary Circulation, Proc. Soc. Exper. Biol. & Med. 39: 202 (Oct.) 1938. Thornton, J. J., and Gregg, D. E.: Effect of Chronic Cardiac Venous Occlusion on Coronary Arterial and Cardiac Venous Hemodynamics, Am. J. Physiol. 128: 179 (Dec.) 1939. Thornton, J. J.; Gregg, D. E., and Mautz, F. R.: Magnitude, Adequacy and Source of Collateral Blood Flow and Pressure in Chronically Occluded Coronary Arteries, ibid. 127: 161 (Aug.) 1939.

5. Beck, C. S., and Mako, A. E.: Venous Stasis in the Coronary Circulation; Experimental Study, Am. Heart J. 21: 767 (June) 1941.

6. Roberts, J. T.; Browne, R. S., and Roberts, G.: Nourishment of the Myocardium by way of the Coronary Veins, Federation Proc. 2: 90 (March 16) 1943.

7. Blalock, A., and Taussig, H. B.: Surgical Treatment of Malformations of the Heart in Which There Is Pulmonary Stenosis or Pulmonary Atresia, J. A. M. A. 128: 189 (May 19) 1945.

8. Gross, R. E., and Hufnagel, C. A.: Coarctation of the Aorta: Experimental Studies Regarding Its Surgical Correction, New England J. Med. 233: 287 (Sept. 6) 1945.

9. Crafoord, C., and Nylin, G.: Congenital Coarctation of Aorta and Its Surgical Treatment, J. Thoracic Surg. 14: 347 (Oct.) 1945.

10. Clagett, O.: Coarctation of the Aorta: Surgical Aspects, Proc. Staff Meet., Mayo Clin. 22 131 (April 2) 1947.

11. Fauteux, M.: Surgical Treatment of Angina Pectoris: Experience with Ligation of the Great Cardiac Veins and Pericoronary Neurectomy, Ann. Surg. 126: 1041 (Dec.) 1946.

12. Blakemore, A. H., and Lord, J. W., Jr.: Nonsutum Method of Blood Vessel Anastomosis: Experimental and Clinical Study, J. A. M. A. 127: 685 (March 24) 1945; Ann. Surg. 121: 435 (April) 1945.

13. Potts, W. J., Smith, S., and Gibson, S.: Anastomosis of Aorta to Pulmonary Artery: Certain Types in Congenital Heart Disease, J. A. M. A. 132: 627 (Nov. 16) 1946.

became occluded by formation of thrombus later on. Eighteen months were spent on the project before we had any definite evidence that the anastomosis was beneficial, and it was almost two years before the first patient was operated on.[14]

Repeated operations were necessary. This work required strong, vigorous dogs free of diseases. Distemper, pneumonia, animal tics and malnutrition were conditions that retarded progress in this research. Indeed, it was not possible to make a test of benefit for the operation during the first year of our work because of these conditions. In the second year of this work a grant from the United States Public Health Service made it possible to work under satisfactory conditions. We found that the bull terrier was the best breed of dog for this work. The operative work required the best in asepsis, mechanical respiration and oxygenation. Three to five hours of anesthesia were required for the anastomosis. We lost a number of dogs because of imperfect absorption of carbon dioxide in a closed system of anesthesia.

Can the Coronary Sinus and its Tributaries Tolerate Arterial Pressure?--During the first year of the work we had about 20 instances of hemorrhage into myocardium. This complication occurred after the sinus was ligated and also after anastomosis was made to the virginal sinus. In the second year of the work this complication did not occur. This complication was due to the fact that we were using sick dogs in poor nutritional condition. This complication disappeared after diseases were stamped out of our kennel and after we began to feed the dogs meat and liver. In healthy dogs we can say that the coronary sinus and its tributaries can tolerate arterial pressure. More recently we used heparin and "dicumarol" during and after operation. We obtained 1 specimen in which there was hemorrhage in the wall of the left ventricle. The hemorrhage was not pronounced and probably was not the cause of death in that experiment. It would appear that the possibility of hemorrhage exists when these agents are used.

The Coronary Sinus in the Dog.--The coronary sinus varied somewhat in different dogs. In many animals the sinus was delicate and for surgical manipulation was like wet tissue paper. In our hands, after two years of intensive work, anastomosis could not be done on the virginal sinus when it was so delicate and thin. In many instances, however, anastomosis could be done satisfactorily. Anastomosis always required intensive concentration. The tributaries to the sinus present a problem. There were two types of tributaries to the sinus. One was the type of relatively large vein which lay beneath epicardium and entered the inferior aspect of the sinus. The other type was a vein of hairlike size that could scarcely be seen that entered the floor of the sinus. The circumflex coronary artery was inferior to the sinus; right auricular wall was superior to the sinus; auriculoventricular node was near the ostium of the sinus. The approach to the sinus was a problem. We approached it from the right side of the chest for most of our experiments, but more recently we have approached it from the left side.

We observed that certain changes took place in the sinus after the sinus was ligated. Ten days to several weeks after ligation the distention of sinus was less pronounced. The wall of the sinus had become thicker so that the sinus could be manipulated with a greater degree of safety. We used preliminary ligation of the sinus as an aid to anastomosis. The optimum interval between ligation of sinus and anastomosis of artery to sinus was ten days to two weeks. We had about fifty failures because the interval was longer. The sinus had become small and the wall rather fibrotic. Ligation of sinus became the first step in the operation in most of our work. Ligation of sinus during the first year of the work had a mortality of about 15 per cent. In the second year of the work the sinus was ligated in 78 consecutive dogs without a death. This difference in mortality was due to the health of the dogs and showed how scientific observations could be influenced by such extraneous factors. The fact that the sinus was ligated in 78 dogs without mortality indicated that the sinus and its tributaries could tolerate increased pressure in the venous system.

The Coronary Sinus in Man.--The sinus in man varied considerably from the sinus in the dog. In man the sinus was a larger and stronger structure. The diameter was almost 1 cm. The wall was thicker. It could be much more readily manipulated. The hairlike tributaries were not found. The sinus was not so deeply buried in myocardium. It could be dissected away from the myocardium for about 1 cm., and this dissection appeared to be safe.

Concerning the Artery for Anastomosis in the Dog.--Attempts to use various arteries were made. The internal mammary, the brachiocephalic and the subclavian arteries were either too small or too short for anastomosis to the sinus. The only artery that could be used was the common carotid artery. This artery could be taken almost always without cerebral complications provided it were taken below the bifurcation. Convulsions and hemiplegia frequently occurred if ligation were done above the bifurcation of the artery. The carotid artery was dissected down to its origin from the brachiocephalic artery. It was turned down from the neck in a direction posterior and lateral to the brachiocephalic artery. A special instrument was made to carry it down from the neck to the heart. The entire dissection was made from the neck. The wound in the neck was closed before the chest was opened. When the chest was opened the instrument was located by the finger and brought out with the artery. For anastomosis the artery was cut on the bias in order to increase the size of the stoma.

14. Beck, C. S.: Revascularization of Heart, progress report, Sept. 13, 1947, Surgery Study Section, United States Public Health Service. (This report covered our work from Feb. 6, 1946 to Sept. 1947).

Concerning the Artery for Anastomosis in Man.—The carotid artery is an important artery in man. Ligation may be followed by cerebral complications. This artery is larger than the normal coronary artery and therefore was larger than necessary for our operation. Its use would necessitate the removal of a piece of clavicle to get exposure of carotid artery where it comes off the aorta. The dissection in the neck would add considerably to the magnitude of the operation. For these reasons we did not care to use this artery. However, there was no other artery that could be used. The internal mammary artery was too small; the subclavian artery and the vertebral artery were not accessible. There was no artery in the abdomen that could be used.

This was a serious problem. Fortunately we were able to solve it. The solution was to make a new branch from the aorta. We used a segment of artery in most of our experiments. A segment of vein might prove to be satisfactory. The length or graft necessary in the dog was 5 cm. For the anastomosis in man the distal end of the brachial artery seems to be of proper size. We believe that this segment of artery can be taken without seriously crippling the hand.

The Anastomosis to the Coronary Sinus in the Dog.—The epicardium was incised for about 1 cm. just above and below the sinus as it entered the atrium. Gentle dissection allowed the sinus to stand out. A special curved ligature carrier was placed between sinus and coronary artery and directed under sinus coming out, in or through auricular wall just above the sinus. The carrier was introduced at two points about 1 cm. apart. The sinus must not be punctured or injured. The first passage of the instrument carried a double piece of silk. The silk was cut and disengaged from the carrier. One piece was used for a ligature. The other piece of silk, which was long, was placed in the carrier and passed between sinus and coronary artery, under sinus and emerging through or in auricular wall superior to sinus. The silk after it emerged was cut. We then had a mattress suture under 1 cm. of sinus together with a piece of silk on each end of the segment. After the mattress suture was tied and after each piece of silk was tied we had the segment of sinus isolated so that there was no blood flowing through it. Two arterial sutures were placed in the wall of the sinus. These were gently held up and sinus wall was cut for about 5 mm. The sinus was washed with a solution of heparin. The artery or vein was brought into position. Four cardinal sutures were placed between sinus and graft, one on each end of the open sinus and one midway on each side. These sutures were everting mattress sutures. They were tied. The anastomosis was completed by a continuous everting suture. The mattress suture was removed as was also one suture occluding the sinus. The occluding suture on sinus between anastomosis and entrance into right auricle was left as an occluding suture (fig. 1).

The Anastomosis of Arterial Graft to Aorta.—We used a segment of carotid artery in the dog because it was more readily available than any other artery large enough for anastomosis. The aorta was dissected free. Two intercostal arteries were ligated and cut. Care was taken to avoid injury to thoracic duct. The Potts, Smith, Gibson clamp was applied to aorta. This clamp made it possible to open aorta and at the same time allow blood to flow through aorta. The aorta was incised for a distance of 5 mm. The incision was made above the compressed margin of the aorta. The graft was cut on the bias. A horizontal, everting, continuous mattress suture was used. The suture was begun at one end. Each suture was properly spaced (fig. 2). Care was taken that the needle did not penetrate aorta twice at one point, as this could lead to hemorrhage. The anastomosis of free arterial graft to aorta was done before the anastomosis between artery and coronary sinus was carried out.

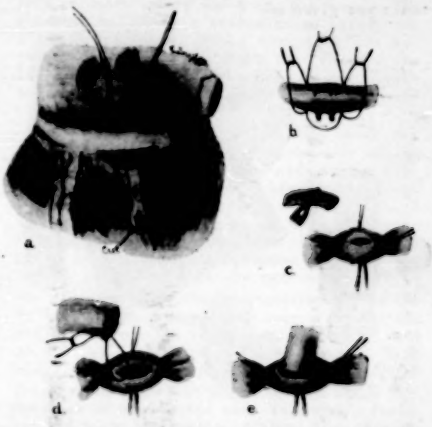

Fig. 1.—Anastomosis in the dog. *A*, dissection of sinus. *B*, isolation of segment of sinus. *C*, sinus opened. *D* one cardinal suture placed between arterial graft and sinus. Sutures are everting of mattress type. *E*, anastomosis is complete. Hemostatic ligation and suture have been removed.

OBSERVATIONS AFTER ANASTOMOSIS

Concerning the Heart.—When the transplanted artery was opened after anastomosis had been made, several observations were noted concerning effect on the heart. The sinus became distended and frequently showed pulsation. The veins became pink. The heart seemed to improve in color. The heart was firmer to the touch. The beat remained regular. It was noted by each of us that the heart seemed to take a more forceful beat after the transplant was opened. A heart which was not doing well during anastomosis did better after the anastomosis was opened. Other factors such as dislocation of the heart might have been responsible for this. Dislocation was released after transplantation was finished. Electrocardiograms did not show any change at the time the anastomosis was opened or later on. The heart did not dilate. Hypertrophy did not develop in those experiments in which sinus was totally occluded between anastomosis and auricle. Cardiac failure did not develop in any experiment.

Number of Patent Anastomoses.—"Vitallium" Cannulas: During the first nine months of the work we used "vitallium" cannulas for the anastomosis. The artery was placed through the cannula, cuffed back over the cannula and held in position by a ligature. The cannula and

artery were introduced into the sinus and held in position by a ligature around the sinus, artery and cannula. Our records showed that there were fifteen patent anastomoses when the dog died or when the dog was killed. The time interval was up to sixty-nine days in 1, over a month in 5 and over a week in 12.

Fibrosis occurred in the segment of artery within the cannula. This process seemed to be progressive. Animals with patent anastomosis during the early postoperative period later on showed occlusion. This method of anastomosis was given up.

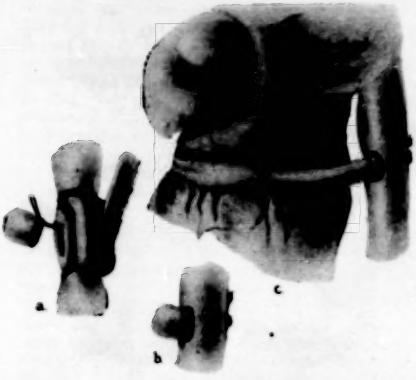

Fig. 2. Anastomosis in the dog. *A*, anastomosis between aorta and arterial graft; Potts, Smith, Gibson clamp on aorta; aorta opened; one everting suture in place. *B*, anastomosis between arterial graft and aorta completed. *C*, new branch from aorta to coronary sinus.

Suture Technic: The "vitallium" cannula served a purpose in getting us started on the research at a time when we did not believe the suture technic was possible. Our records showed that there were thirty or more patent anastomoses with the suture method. The longest period between anastomosis and the time when the dog was killed for the specimen was four and one-half months. Thrombosis and occlusion occurred in many specimens. We believe that this was related to trauma of the operation. As a rule we could predict at the time of operation whether the anastomosis would remain patent. Anticoagulant agents were not used for this work. More recently they have been used.

Health of Dog after Anastomosis.--As a rule the postoperative period was uneventful after anastomosis was done. The first dogs to go through the operation were watched with great interest to see how the heart would stand the increased circulation. The dogs tolerated the anastomosis well. They were up as usual the following day and, after several days, they were as active as other dogs. Circulatory failure was not observed in any experiment. Some of the dogs had murmurs; others did not. The electrocardiogram was essentially normal.

MEASUREMENTS OF BENEFIT

These were made by determination of mortality following ligation of descending ramus of left coronary artery at its origin in one step and also by determination of size of infarct following this ligation.

Mortality.—The following operations were done in sequence. 1. The descending ramus of the left coronary artery was dissected at its origin and a piece of silk was placed around the artery, but it was not tied and the artery was not constricted. This piece of silk was an aid to ligation of the artery later on. 2. Complete or partial ligation of the coronary sinus was done one or two weeks after the first operation. 3. Ten to fourteen days after ligation of the sinus, anastomosis between the carotid artery and the coronary sinus was carried out. 4. Two weeks later the coronary artery was ligated as referred to in 1. The silk thread helped in the isolation and ligation of the artery. It was completely occluded. After ligation of the artery the dogs were kept for a period which varied from sixteen days to four and one-half months. Two series of dogs of 10 each are presented. In one series the anastomosis was patent. In the other series the anastomosis was completely occluded by thrombus. In the control series with blocked-off anastomosis death occurred in 7 and recovery in 3. Four died within one hour after ligation of the artery; 2 died within the first twelve hours and 1 died forty-eight hours after ligation. In 50 normal dogs with this artery ligated the mortality was 70 per cent[4] and in 57 dogs with ligation of the sinus at one operation and ligation of the artery at a subsequent operation the mortality was 61 per cent.[5] In the series with patent anastomosis the entire group of 10 survived the immediate effect of the ligation; 1 died eight days later; 1 died thirteen days later; 8 recovered.

Infarcts.--The infarcts were observed. The 3 specimens of the control group showed destruction of myocardium by observation of the surface of the heart. None of the patent group showed such evidence of destruction on the surface of the heart. The specimens were cut. Each of the control specimens showed extensive destruction of myocardium. None of the group with patent anastomosis showed extensive destruction of myocardium. In 4 specimens there was no infarct. In the other 6 specimens including the 2 that died the destruction was limited to scattered areas of a few square millimeters. In no specimen of the group was there extensive destruction involving entire thickness of myocardium. These results showed that the anastomosis was beneficial. They showed that the degree of benefit was definite. The anastomosis made it possible to ligate a major coronary artery with no immediate mortality and with little or no destruction of heart muscle.

INJECTION OF SPECIMENS

A considerable quantity of blood may pass through an arteriovenous fistula. Specimens of hearts were examined in reference to this possibility. We examined venous tributaries in the normal heart, in the heart after occlusion of sinus and also in the heart after anastomosis had been made. It was obvious that adjustments had to occur after the sinus was ligated. Blood escaped from the heart through other channels. There were two exits for this escape of blood. One was through the intramyocardial channels that empty into the four chambers of the heart. The other was a system of superficial veins that drain blood from the coronary sinus system into the right atrium. In the normal heart of the dog these superficial veins were found both anteriorly and posteriorly over the right ventricle. After occlusion of sinus these veins were usually increased in size and number. After anastomosis these veins were approximately the same as after occlusion of coronary sinus. Twenty-two cleared specimens with patent anastomosis were examined. Arteries and veins were injected in these specimens. In 2 specimens these veins were fairly large and numerous; in 20 specimens these veins were not larger or more numerous than in specimens after occlusion of the sinus.

Our conclusion was that in most specimens the superficial channels draining blood away from the coronary sinus system were of no special significance. The possibility existed, however, that these veins can develop, and in 2 specimens these veins did develop. Should these veins drain off any significant quantity of blood it would be possible for these to reduce the flow through the myocardium and thereby impair physiologic benefit of the operation. If this complication should develop, it would be possible to ligate these veins at the time of anastomosis. In the human heart there were no superficial veins anteriorly, but posteriorly one, or two or three channels were found. These channels will be ligated at the time of anastomosis in the human patient.

It was possible to obtain information on bloodflow in both the superficial channels and also in the intramural channels by injection of blood into the coronary sinus in the normal heart, into the coronary sinus after ligation of the sinus and also into the sinus after anastomosis to an artery had been done. The heart was removed and injection performed immediately. The dog's own heparinized blood was used. The pressure for injection was 120 mm. of mercury.

Normal Heart.—A cannula was placed in the coronary sinus and one was also placed in the left common coronary artery. When blood was injected into the sinus an average figure of 9 cc. per minute was recovered from the coronary artery. No blood was obtained from the right coronary artery.

After Occlusion of Coronary Sinus.—The sinus was ligated and several weeks later injection of blood was done as in the normal specimen. The average amount recovered from the artery was 22cc. per minute.

Patent Anastomosis between Carotid Artery and Coronary Sinus.—In 10 specimens the average amount of blood that was injected into the transplanted artery was 60 cc. per minute and the average amount that was recovered from left coronary artery was 6 cc. per minute. The greatest inflow into transplanted artery was 175 cc. per minute. When the injection was reversed the average amount that entered the left coronary artery was 100 cc. per minute and only 1 cc. was recovered from the transplanted artery.

Comment.—It can be stated that there are communications between the venous side of the circulation and the arterial side of the circulation which in the dead specimen allowed blood to flow in a retrograde direction. A larger quantity of retrograde flow was recovered after the sinus had been ligated as compared to figures in the normal heart. After patent anastomosis of the carotid artery to the sinus was made, it is significant that the inflow through transplanted artery to vein was not excessive. The inflow was about the same as the inflow into the coronary artery. This situation does not exist in arteriovenous fistulas in other parts of the body where the pressure on the venous side is comparatively low and large quantities of blood flow through the fistula. In this respect anastomosis of artery to coronary sinus differs from all other arteriovenous fistulas. Because inflow of blood into transplanted artery and inflow into the coronary artery were about the same, it would appear that the resistance to flow in the vascular bed of the myocardium was about the same whether the blood entered by way of the vein or by way of the artery. That blood was not freely siphoned off into the cavities of the heart was, indeed, a favorable condition in terms of application to patients. There appeared to be no wide open fistula effect either within the myocardium or in the superficial veins draining blood directly into the right atrium. Long term experiments may provide different results. These should be done.

Specimens with Patent Anastomosis and Partial Occlusion of Sinus.—It was routine procedure to place a ligature of silk around the sinus at a point between the ostium of the sinus and the anastomosis between the artery and the sinus. If complete occlusion of the sinus were not produced then an arteriovenous fistula would develop into the auricle. This occurred in 8 of our specimens. An opening was found when blood was injected into the transplanted artery. The amount of blood escaping through this opening, a pressure of 120 mm. of mercury being used, was 65, 92, 118 and 225 cc. per minute. In 1 or 2 of the specimens

the heart appeared to be questionably enlarged. It is possible to prevent this complication by placing two ligatures around the sinus and dividing the sinus between ligatures. It would appear that a small fistula might have therapeutic value. The increased flow through anastomosis might reduce the possibility of formation of thrombus. It is a point to bear in mind that a temporary fistula might have therapeutic value.

APPLICATION TO PATIENTS WITH SCLEROSIS OF CORONARY ARTERIES

At the end of two years of experimental study we were ready to apply the operation to patients. During the past two years approximately 100 patients with coronary artery disease had come to one of us (C.S.B.) for operation. These patients were advised to wait until this new operation was developed. Recently the names of 8 patients were selected to come into the hospital for study. Of these 8 patients, 2 had died. The first patient of the group who was admitted to the hospital for study had a markedly dilated heart and appeared to be threatened with failure. He was not accepted for operation because the risk appeared to be too great. We believe that a failing heart would be benefited if the anastomosis could be done. We believe that the heart will improve when arterial blood is turned into the heart. Irreversible damage existing in the heart will remain as such and no doubt will influence the clinical result after operation. The undamaged muscle, however, should be given restoration of function by the operation. The question arises, therefore, whether patients who have signs of failure should be operated on. It would appear to us that any salvage out of this group would be on the credit side even though the mortality of operation reached a figure as high as 50 per cent. If this group of patients showing circulatory failure is accepted for operation it would appear reasonable to keep this group separate for statistical purposes. We believe that there should be some salvage in this group and the only way to find out is to operate on a number of them.

Operation on Patient Jan. 27, 1948.—The operation was carried out on a patient who had had severe coronary disease over a long period of time. He was almost incapacitated. A graft of brachial artery was used between the aorta and the coronary sinus. The segment of brachial artery had some atheromatous deposit in it. The anastomosis was done as described in the experimental work. The patient tolerated the procedure and the results will be reported at a future date.

CONCLUSIONS

A systemic artery or a new branch from the aorta was grafted into the coronary sinus in dogs. The technical aspects of this operation were developed. This anastomosis was beneficial. The degree of benefit was marked. After this anastomosis was done it was possible to ligate the descending ramus of the left coronary artery at its origin in one step with no immediate mortality and with little or no destruction of heart muscle.

After anastomosis was made between artery and sinus, the specimens did not give significant evidence of excessive drainage of blood by way of intramural channels or by way of superficial veins that empty into the right antrium. Additional evidence on drainage channels in long term experiments is desirable.

This operation was applied to 1 patient who had severe coronary artery disease. A new branch from the aorta was made with a segment of brachial artery. The patient tolerated the operation. The clinical results will be reported later.

PSYCHOTHERAPY IN EVERYDAY PRACTICE

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I speak as a practitioner of medicine and not as a psychiatrist, and that is a different matter. When a patient comes to the psychiatrist he comes prepared to discuss his emotional problems, but when he consults a general physician he is almost always looking for a physical cause for his trouble.

But in at least one third of all the patients who consult a physician no definite bodily disease can be found to account for the illness, and in another one third of all patients the symptoms are not explained by, or are out of proportion to, any organic disease that can be discovered. In this group of patients are many in whom there seems to be a definite relationship between the emotional life and the physical disease; in other words, the emotional factor apparently plays an important part in causing the disorder. This is the group to which the term psychosomatic affection is often applied.[1]

While psychosomatic is a new term, it describes an approach to medicine as old as the art of healing itself. It is not a new specialty but rather a point of view which applies to all aspects of medicine and surgery. It connotes the simultaneous application of physiologic and psychologic technics in the study of illness. It does not mean to study the soma less; it only means to study the psyche more. It is not a new discovery, but rather a reaffirmation of the ancient principle that the mind and the body are interactive and interdependent, a principle that has always guided the intelligent general practitioner. Indeed, the traditional old family doctor often was an excellent psychosomatic physician, although he never thought of himself as such. He and his patients usually were intimate friends, and he was familiar with their social situation, as well as with their psychologic and physical peculiarities. He was well aware that these factors were related to illness. As a science, psychosomatic medicine aims at discovering the precise nature of the relationship between the emotional life and bodily illness.

Read before the Section on General Practice of Medicine at the Ninety-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1947.

From the Department of Medicine, Temple University Medical School.

1. The term psychosomatic as used in this paper indicates: (1) a method of approach to general medical problems—the simultaneous application of physiologic and psychologic technics to the study of illness in an effort to make a definitive diagnosis and in preparation for comprehensive medical care; (2) in a more limited sense, a disorder which can be understood only when psychologic as well as physiologic factors are taken into consideration (Halliday [1]

It is the special point of this paper that psychosomatic technics of diagnosis and treatment must become an integral part of the practice of medicine in order to fulfil their promise and meet the challenge of present day medical problems. The enormous number of psychoneurotic and psychosomatic problems turned up by the Selective Service process and encountered in military medicine indicates where the emphasis must be placed in the practice of medicine. World War I established psychiatry on a firm scientific basis and World War II has seen its more complete integration into general medicine, in other words, psychosomatic medicine. When that integration is accomplished there will be little need for the term psychosomatic; good medicine will be psychosomatic medicine.

PSYCHOSOMATIC DIAGNOSIS

When a person gets sick he is sick all over; that is, the body and mind are one, and he gets sick for a variety of reasons, physical and psychic. In other words, it is usually not one thing that determines illness; there are multiple factors acting together. In our approach to illness Halliday [2] stated that we must think: 1. What kind of a person are we dealing with (inherited and acquired characteristics, physical and psychologic)? 2. What has he met (germs, allergens or emotionally disturbing events)? 3. What has happened (the physiologic mechanism or pathogenesis of the disorder)? For example, allergic responses occur when a prepared organism, possessing certain physical and psychologic characteristics, meets certain elements, physiologic and psychologic. In some allergic disorders a single preponderant factor may be largely responsible, as for example in pollen hay fever. In others, such as asthma, there are frequently multiple interrelated factors, allergens and emotional disturbances, which act in a complementary fashion to produce the disorder.

Just as I insist on this unity regarding the nature of illness—the body and mind are one—so do I urge that the means of investigation are two—physical and psychologic—and their simultaneous application represents psychosomatic diagnosis. Moreover, they are applied simultaneously, although their application is often unconscious and unscientific. We physicians in our usual approach to the patient, using the orthodox methods of medical history, physical examination and laboratory studies, at the same time make many intuitive observations about the unconscious mental processes of the patient as exhibited in his language and behavior. What is here suggested is that order be brought into this intuitive process. We now have enough understanding so that we can begin to forge a scientific instrument in the exploration of unconscious mental processes (Kubie [3]). In other words,we are trying to make the rules regarding psychologic exploration as exact as the rules of physical investigation.

Rather than be satisfied with loose terminology—neurogenic factors, emotional upsets, physical and mental fatigue, emotional stress and strain—we must make an effort to define the specific emotional problem and relate it to the total personality makeup of the patient.

Just as we try to establish certain postulates for an allergic problem, hay fever for example, (1) heredity, (2) seasonal history, (3) skin tests, (4) antibodies, (5) induction of an attack with pollen and (6) hyposensitization or avoidance of offending substance in controlling attacks, so in the psychosomatic problem we try to establish (1) a family history (heredity and pseudoheredity) that suggests a background for psychologic difficulties; (2) evidences for a childhood neurosis; (3) sensitivity to specific emotional factors (temporal relationship of present illness and emotionally disturbing event), especially at epochal or crucial life periods (puberty, marriage, childbirth, climacteric, etc.); (4) a specific personality structure (other evidence of neurosis or character disturbance); (5) demonstration of specific behavior on taking the history (artificial exposure to a conflict situation); (6) hyposensitization by psychotherapy or the avoidance of the provocative situation.

We will not be able to establish all of these postulates in every case. For example, evidence for a childhood neurosis will often be missing—neither the patient nor his family can recall disturbed behavior or bodily dysfunction.

So far as allergy is concerned the fact that the removal of an allergen or a hyposensitization process "cures" the patient proves only that one factor has been removed and the morbid chain of events interrupted. Exactly the same reasoning can be applied to psychologic factors.

Heredity is often held responsible for illness that arises from the environment. This is an important consideration to which too little reference has been made. Children identify themselves with their parents and unconsciously imitate them, and thus patterns of behavior are laid down (which include illness as an aspect of behavior) so early in life that we often attribute a disorder to heredity when in fact it was acquired. This of course is an involved question, and I presume that the final answer can hardly be hoped for, that is, to separate constitutional and environmental factors with precision. But unconscious identification with a sick parent or other member of the household in early childhood often is the basis for an illness later in life which we may attribute wholly to heredity. When a young child is exposed to a sick parent it often shows the effect in psychosomatic illness in adult life.

Body Language.—Body language is a satisfactory explanation and approach to many medical problems. It has been suggested that the most satisfactory way to deal with tension is by action, the least satisfactory is by thought, and in between is speech. In other words, in all persons with psychosomatic illness there is some impairment of total functioning, and often a great deal of energy is consumed by thought (fantasies). If we can encourage them to get their thinking onto the surface by talking about their problems we can often understand the illness better and at the same time provide some measure of relief. Thus I often say to my patients that they are like engines with the steam up. If the wheels do not go around in productive work and the whistle is not blowing in talking about their troubles then the steam must try to get out somehow and it makes an effort to part their seams. It is a homely explanation which people readily grasp, as they realize that this short circuiting of energy is capable of disturbing their bodily functions. Therefore we can say to patients that if they cannot express their tension by word or action—if they cannot say with their mouths what is disturbing them—then one of their organs will try to say it for them. Thus, the patient with nausea, who has no evidence of organic disease, may be indicating that he cannot "stomach" certain situations; the patient with an itch often "lets things get under his skin." Many additional examples could be

2. Halliday, J. L.: Principles of Etiology, Brit. J. M. Psychol. 20: 367, 1943.
3. Kubie, L. S.: Human Constitution in Clinical Medicine, by G. Draper, C. W. Dupertuis, and J. L. Coughey, Jr., book review, Psychoanalyt. Quart. 13: 501, 1944.

given [4] to show that the patient often expresses his body language in symbolic formulas if we would only listen to him.

Another satisfactory way to get patients to discuss themselves in relation to their illness is to use a case illustration. Repeatedly this is effective when other methods of trying to make patients see the relationship between emotions and illness fail. If the physician can think of an apt case illustration the patient can readily identify himself, and even if there are pronounced divergences the patient will often see a partial application which will encourage him to talk about his personal life. Sometimes he will deny the application only to go on from that point to discuss emotional factors of importance which previously he was unable to think of.

History Taking.—An important element of the doctor-patient relationship enters into the taking of the history. I cannot discuss all of the qualifications of the physician who should interest himself in psychosomatic problems. Here it is only necessary to say that he must be so constituted that he can listen to the patient uncritically. Sympathy for patients suffering from illness of emotional origin is an essential part of the equipment of the physician who would interest himself in psychosomatic problems. If he is unsympathetic it will show in his manner and will discourage the patient from revealing feelings that are essential to an understanding of the problem.

In addition, a physician's ability to use the psychosomatic approach will depend on his knowledge of psychopathology and tissue pathology applied simultaneously. Therefore his human understanding, sensitivity and sympathetic appreciation of emotional factors as a cause of illness, as well as his orientation and experience, are all important in determining his ability to deal with psychosomatic problems.

Experience, of course, is important in history taking, but if one practices medicine for fifty years he will still have to give time to the patient. In other words, there are no short cuts in history taking—while the most experienced persons will quickly grasp the situation, time must be taken because the patient cannot be hurried.

The revered family doctor of the small community utilized his knowledge of his patients' personal lives in evaluating their history. He knew everything that was going on and had a background of understanding gained from personal observation. Now in our elaborate medical institutions, with a lack of knowledge of the patient's background, we overemphasize the so-called scientific aspects of medicine and relegate to the background the social and emotional factors that may enter into illness. As a consequence our methods of history taking have not kept pace with other methods of progress in medical science. Really our history forms and technics are indicative of one of the basic faults in medical knowledge and medical teaching.

The body is still divided into many organs and systems; specialists look on disease from their narrow point of view, and the curriculum is built up by introducing more and more special points of view. As a consequence the comprehensive point of view, which is so necessary to the study of illness as an aspect of behavior, makes little headway. The medical history form which we give to our medical students reflects this organic approach and this age of specialization, and we look in vain throughout a long history for some evidence of the human being who is sick. If patients were allowed to talk more and were examined less it would be a good thing for medicine in general. As one patient who had been through the mill of medical investigation recently remarked, she was suffering from "testitis." Indeed how numerous are the patients who have been examined again and again by means of the roentgen ray, chemical studies and various other expensive and complicated methods, accumulating a sheaf of papers, but with an end result hurtful rather than helpful because the diagnosis was obscured by concentration on a part rather than on the whole.

The majority of persons who consult a general physician wish to find some physical cause for their ailment, and thus fall readily into the system of answering specific questions about physical health and volunteering no information about themselves as persons. Moreover, people look on the physician as an authoritarian figure who will "do something" about their illness and are usually quite unprepared to have "to do something for themselves"—in other words discuss themselves as persons as well as "medical cases." We must look for the person in the patient. I have frequently observed that the patient who insists "that his illness is physical" is apt to be suffering from a disorder of emotional origin, while the patient who is eager to blame it on the psyche often has an organic disease. Many persons, seriously sick with advanced organic disease, seek to delude themselves with the idea that it may be "all mental." This applies especially to the many lay persons who have now read some of the popular writings on psychosomatic medicine.

The introduction of the psychosomatic point of view does not require a different form of history taking; it only requires an awareness of the role that the emotions play in illness and hence more emphasis on certain aspects of history taking. Thus the history need not differ in form but it must differ in substance. In accordance with what has been said more attention will be paid to the behavior of the patient and to the actual words that he uses in describing his complaints as well as the asides and apparent irrelevancies that so often give important clues to the emotional factor. Other fundamental considerations are to give the patient time, allowing him to talk with as few interruptions as possible. Avoid extensive notetaking, so that the patient may feel that you are more interested in him as a person than in the setting down of the history. Show interest and sympathy for what the patient sometimes regards as trivial or silly and pay close attention to the chronologic development of the life history, with special emphasis on the various factors in the childhood period that may have influenced the development of the personality. Special attention should be given to puberty and adolescence with their frequent emotional problems and to the epochs and crucial periods in life when psychosomatic disturbances are apt to arise. Inquire into the health of the spouse; neurotics have a way of attracting one another. Try particularly to obtain a more complete picture of the family background.

Chronologic Development of Life History.—There are two main approaches to the study of the patient with suspected psychosomatic disorder: a cross section study of his personality as he appears at the time of the interview and a longitudinal survey of his life from family background and early infancy to the present time. The first approach, the cross section point of view, is combined with the story of the present illness. It is the traditional approach of the physician to his patient, and the only requirement so far as the psychosomatic history

4. Weiss, E., and English, O. S.: Psychosomatic Medicine, Philadelphia, W. B. Saunders Company, 1943, p. 10.

is concerned is to develop the social and psychologic aspects in order to see if there is a relationship between the life situation and the medical illness.

The cross section approach tries to relate the present illness and the precipitating emotional factor. The longitudinal study relates personality development and the past medical history. It gives a better idea of the personality structure and psychopathology because it shows the background and the development of the personality. One technic does not exclude the other. On the contrary, the data derived are complementary and help to make up a definitive psychosomatic diagnosis.

Definitive Diagnosis.—Just as in a consideration of somatic disease it is necessary to make a complete diagnosis before we can hope to apply scientific treatment, so it is equally necessary in psychosomatic medicine. Hence, just as in general medical teaching, we have always emphasized etiologic, anatomic and functional diagnosis, so in psychologic medicine, as pointed out by Levine,[5] it is necessary to make a clinical, dynamic and genetic diagnosis before we can stand on safe ground in regard to psychotherapy.

The clinical diagnosis in psychosomatic medicine refers to the structural and physiologic deviations as well as to the underlying or associated psychologic disturbance. For example, in the so-called organ neurosis, we should like to know whether we are dealing with a mild personality disorder such as hysteria or a severe personality disorder such as hypochondriasis. It is important, in a functional gastrointestinal complaint, to know whether the symptoms are on the basis of conversion hysteria or a part of the clinical picture of depression in which the mood disturbance is overshadowed by the somatic complaints. When one deals with depression there is often the threat of suicide.

Dynamic diagnosis refers to the meaning and purpose of the symptoms or behavior in terms of the particular personality and its structure. When this is coupled with the genetic diagnosis, which is derived from the longitudinal survey of the individual life history, we are then in a position to plan comprehensive medical care.

PSYCHOTHERAPY

Patients do not have to be told, "You are now undergoing psychotherapy." What we must do can be done in the usual relationship between physician and patient. 1. After a medical history, which takes account of personal factors as well as "medical facts," we should make a complete physical examination and such laboratory tests as are necessary to exclude physical disease or to establish the precise nature of the organic problem and the amount of disability which it in itself is capable of causing. 2. When the patient has been assured that there is no physical disease or that disability is out of proportion to the disease, it is usually easy by examples of psychic causes for such physiologic disturbances as blushing, gooseflesh, palpitation and diarrhea to make the patient understand that a disturbance in his emotional life may be responsible for the symptoms. 3. Continue to look for the person in the patient. The more one can persuade such a patient to talk about "his other troubles" the sooner does one come to an understanding of the "present troubles." The greater the success in switching the conversation from symptoms to personal affairs, the sooner does one come into possession of the real problem disturbing the patient. Encourage him to talk about himself as a person rather than as a medical case.

Usually one or more of three special fears are uppermost in the minds of such patients. One of the most common is fear of cancer; cancerphobia. A great many patients think they have cancer, and indeed most women who consult physicians will have the idea at some time. They do not always express it; in fact, they rarely directly express their fear of cancer. They often disguise it by a complaint about a lump, a swelling or a curious sensation in the abdomen or breast, and when they are assured at the end of a complete physical examination that they are free from organic disease, they heave a sigh of relief and say, "Oh, I am so glad because I thought I might have a cancer." With all of the propaganda for the early detection of cancer these fears are exaggerated, and I presume it is the price that we must pay for instructing people about cancer. I am not, of course, advising against such instruction; it is only that we must realize that we add to the apprehension of many patients by our emphasis on the early detection of cancer.

Another common fear is of heart disease. When pain in the precordial region as well as rapid beating of the heart, breathlessness and fatigue occur, suspicion of heart disease often arises. If it is remembered that the pain of cardiac neurosis bears no definite relationship to effort, is frequently described as sticking, needle-like, or soreness, that often it is associated with inframammary tenderness and hyperalgesia, so that the pressure of the stethoscope sometimes elicits it, and that it may be accompanied by a sense of choking as well as sighing respirations, there will be no difficulty in the differential diagnosis, particularly when these symptoms are associated with the whole picture and life situation of the person with cardiac neurosis.

The problem is not an easy one because the patient is apt to insist, "But there must be something the matter." He cannot understand that so much distress can occur unless some vital organ is seriously affected. Moreover, if one does succeed in reassuring him for the time being, he may continue to hold the reservation, "But if this sort of thing continues surely something will happen"; in other words, "How long can my heart stand this?" Telling the patient to control himself is like trying to hold back steam under pressure—if it does not come out the spout it tries to blow the lid off the tea kettle. Really a person is quite as incapable of controlling his anxiety as he would be incapable of controlling his own acutely inflamed appendix. As long as the discussion is kept on the level of trying to persuade him that he does not have physical disease one gets no place because one cannot argue with an obsession. One must get at the mixed feelings, the conflict, that underlies the anxiety, and this can only be done by encouraging the patient to talk about his personal problems. This discussion will usually have to do with the family group. For example, in a patient whom I saw recently, a young married woman caring for a sick mother, the feelings of respect and devotion opposed to the inner resentment at the effort and cost and disruption of her own family life led to anxiety which could not be dealt with as long as the approach was on the level of reassurance regarding the absence of organic disease, telling the patient that she must control herself, and giving phenobarbital.

The inability to concentrate often gives rise to the fear of "losing the mind." Along with this fear frequently there are ideas of suicide. Both are distressing to the patient and usually are not volunteered. When the patient is assured that it is his feelings which are involved and not his "mind" and that the reason his "memory fails him" is because he is so preoccupied with

5. Levine, M.: Proceedings of the Brief Psychotherapy Council, Chicago, Institute of Psychoanalysis, October 1942.

concern over his problems, then he may confess his fear that he was "losing his mind" or his ideas of doing away with himself.

Once these ideas are brought to the surface and ventilated, and the patient receives sufficient reassurance, then often much improvement occurs. Indeed the intensity of the fear and the amount of reassurance necessary to abolish it serve as a crude index to the depth of the neurosis.

It is a good rule to listen rather than talk. Giving advice on highly charged emotional matters is dangerous. To paraphrase Lindemann,[6] "Clumsy psychotherapy is as dangerous to the social life as clumsy surgery is to the physical life."

Marriage and Parenthood as "Cures."—One more point should be emphasized: The gastrointestinal tract is, above all other systems, the pathway through which emotions are often expressed in behavior. Why this is so becomes apparent when one considers that the infant's first contact with the world is through the mouth so that the processes of feeding and feeling must relate themselves to one another. Therefore, on the love and security or anxiety and insecurity which become associated with the nursing process will depend many of the psychosomatic relationships of adult life, called forth by events which awaken old associations. Truly it can be said that bed and board are as indissolubly related in the life of the adult as are sucking and sensuality in the life of the infant.

People almost always blame their illnesses on "something they et.". I say, "No, it's probably something you met." And so often it is true that the life situation has precipitated the trouble but instinctive tendencies place the blame on something swallowed; i.e., the food eaten at the time. In the same connection, people are gullible about wanting a cure by "swallowing" some magical medicine, vitamins, for example. I say to them, "The cure is not in swallowing; it's in spitting out"; in other words, talking about some of the things that are causing trouble.

It is not unusual for physicians to recommend pregnancy and parenthood as a cure for neurotic and psychosomatic illness. This prescription is rarely if ever of value. It is a rather safe rule that the unstable person will not be helped by becoming a parent, but will usually be made worse as a result of the added responsibility. How often on taking the history of neurotic persons, and especially women, does one hear, "I was perfectly well until my first child was born, but I haven't had a well day since." It is true that some neurotic women will feel better during pregnancy, but they pay dearly for their short period of improvement. Nor should the cost to the child be forgotten. Not only does parenthood not cure neurosis but it prepares the way for another spoiled life, because this is surely one of the ways in which neurosis is perpetuated. The atmosphere of the home in which there is serious emotional maladjustment creates the culture medium for the development of further emotional problems. This is the real "social disease." Psychologic contagion is as important as germs in causing illness. The advice to an incompatible couple—"What you need is a child; then you will have a common interest"—is as unenlightened as it is dangerous. While it may succeed in holding the marriage together, who can say how many children are thus sacrificed on the altar of incompatibility?

The Attack of Anxiety.—Rather frequently the first pronounced evidence of neurosis may be an attack of anxiety, and again and again in studying the histories of patients with chronic invalidism of emotional origin one finds that the first outspoken manifestation of illness was the sudden onset of anxiety with apprehension and dread. There are a feeling of weakness, sweating and a sensation that something terrible is about to happen. There are dyspnea, palpitation and, sometimes, nausea. The attacks usually last only a few minutes and subside rather quickly but may last for an hour or more. Weakness and fatigue follow. The emotional as well as the physical distress is so pronounced as to cause the patient to conclude that some serious physical disability is present. Almost never does he conclude that his difficulty is emotional. Most people prefer to think that physical distress means physical disease, and unfortunately physicians too frequently have assisted them in this belief. When a patient with an acute attack of anxiety is first examined, the physician notes the rapid pulse and listens to the pounding heart and all too often permits the patient to believe that the heart is diseased, that hyperthyroidism is present, or covers his unwillingness to make a diagnosis of a psychologic disorder by using some such term as neurocirculatory asthenia or autonomic imbalance. To give drugs and do nothing about fear is to mislead the patient into feeling that his distress is due to a physical disease rather than to an emotional disorder.

What is Psychotherapy?—What, indeed, is psychotherapy? Too often it is assumed to be something vaguely referred to as "the application of the art of medicine." This defies analysis but seems to represent a combination of the experience and common sense of the seasoned practitioner, an intuitive knowledge of people, the cultivation of a charming bedside manner, such trifles as serving food in attractive dishes and the generous use of sedatives, placebos and reassurance. The psychologic approach in medicine, essential for psychotherapy, consists of something more. It is a medical discipline to an equal degree with internal medicine itself. It is an effort to understand the personality structure of patients, the mental mechanisms which are at work and the specific relationships of psychologic situations in the precipitation of the illness.

Reassurance, in the majority of instances, unless combined with an analysis of the illness from the standpoint of the behavior, gives only temporary help and depending on the degree of anxiety, has to be repeated constantly, like a dose of digitalis in a failing heart. Closely allied to reassurance is another superficial treatment that rarely results in more than temporary help; i.e., environmental manipulation, without any attempt to give the patient insight into his conflicts.

Real psychotherapy, which is directly the opposite of simple reassurance, tries to make the patient understand the meaning of his symptoms and the nature of his conflicts. It is a process of reeducation and, when properly done, leads to sufficient emotional development so that the necessity for symptom formation is abolished. The best example of this kind of psychotherapy is psychoanalysis, but for various reasons this method cannot be applied directly to the majority of patients. Nevertheless, psychoanalytic insight and guidance prove adequate to handle the emotional factor in the majority of psychosomatic disturbances. Between simple reassurance at one end of the scale and adequate psychoanalysis at the other there are all degrees of psychotherapy which can be applied, depending on the degree of illness and circumstances of the patient.

6. Lindemann, E.: Therapeutic Procedures in Psychoneurosis, New England J. Med. 227: 584, 1942.

Major and Minor Psychotherapy.—A considerable number of these patients cannot be sent to psychiatrists, nor is it necessary. Not that there is anything reprehensible about consulting a psychiatrist—this too is a problem of education—but there are not enough psychiatrists to take care of the thousands of patients, and moreover, as I have tried to show, a great part of this work lies in the field of general medicine. Another way of stating the problem is to say that there are a major and a minor psychotherapy just as there are a major and a minor surgery. Many physicians who practice general medicine feel themselves capable of doing minor surgery, but only a few have the skill to attempt major surgery. They would not permit themselves to attempt something for which they are not prepared. This is just as true in regard to psychotherapy. The general physician must be able to treat the minor ailments, but he must be able also to recognize when the problem is beyond him, and then refer the patient elsewhere for major psychotherapy. Such knowledge and such an approach frequently will save the patient from unnecessary troublesome and expensive medical or surgical treatment with a resulting further degree of invalidism.

Cost of Psychotherapy.—What about the question of time, effort and expense of psychotherapy? True it is that all of this takes time and effort and must be paid for; yet when one looks into the time, effort, and expense that have been expended by many patients or by institutions taking care of these patients in the usual medical approach, one realizes that an hour or two well spent in a discussion of the life situation of such patients would obviate a great deal of this expense. It is amazing what the total expense of a great many of these unnecessary studies amounts to so far as the institution is concerned, and of course the same thing is true in the case of private patients. The day is close at hand when we will regard some of these "thick chart" patients, this polyphysical approach, with the same amusement and disdain with which we now regard the polypharmacy of a bygone age in medicine. Hospitals are beginning to understand that it is not only intelligent but economical to utilize the service of a psychiatrist in the general medical division, and this same idea can of course be applied to private patients, with this difference, that the majority of them can be and should be handled by the general practitioner. But he asks, "How can I possibly take the time to do this and, if I do, how can I make a living?" I answer that it is not necessary, of course, to make such a detailed inquiry in every patient that one sees, but, in chronic illness in particular, when one feels the necessity for such a study, then time must be taken and in the end will prove economical not only from the human standpoint but from the standpoint of cost of medical treatment. If one cannot take the time in the midst of a busy office hour for a special patient then an appointment can be made for the purpose. It will be worth while as far as the health of the patient is concerned and in satisfaction to the physician.

SUMMARY

The main point of this discussion can be stated briefly: The study and treatment of illness constitutes much more than the investigation and eradication of disease. Yet there is nothing new or startling in this point of view. We have heard a great deal in recent years about the study of the organism as a whole, but for most part we have been paying only lip service to this concept. We have been led to believe that the art of the physician, having to do with his common sense or intuition, as opposed to his science, is sufficient to grasp the problems that we have been considering. It is not enough. A real understanding of psychodynamics is necessary in order to study the emotional life in relation to ill health.

It is my hope that every physician will be so trained that he may be able to understand and manage the many emotional problems that are presented to him daily. At the postgraduate level we need short orientation courses in centers that are properly staffed. At the graduate level better training facilities should be developed for residents in medicine, and the other medical specialities, to acquire the psychosomatic approach to medical problems. At the undergraduate level, we need, not more and more hours of psychiatry inserted into the curriculum, but a real integration of the psychosomatic point of view in every department, preclinical as well as clinical. As Margolin [1] has well said, we need homogenization instead of stratification. This of course must wait until teachers are available in these various departments who have a real understanding of psychodynamics. And beyond this, or rather before this, our students must come to us prepared in the social sciences as well as in the physical sciences. And the social sciences must include a psychology that gives a better explanation of human behavior than is now furnished in most colleges. All of this, unfortunately, is a long way off, and yet we are moving swiftly. Military medicine gave a great impetus to this development and the pressure is going to come from the people themselves. We would be wise to anticipate them. Therein lies our hope for an important development in medicine. As a part of this process and essential for its development general hospitals must establish divisions for the observation and treatment of psychoneurotic and psychosomatic problems. The time has passed for psychiatry to lead an isolated existence. Until it is brought into physical proximity with general medicine it cannot achieve final integration into the body of medical knowledge.

ABSTRACT OF DISCUSSION

Dr. O. Spurgeon English, Philadelphia: Patients like familiar terms when the cause of their illness is diagnosed. They feel at home with words like ulcer and bronchitis, as they have some experience already with these conditions. They feel less sophisticated about anxiety and the symptoms it will produce such as weakness, dyspnea, palpitation, nausea or dizziness. In this field it is well to be armed with what Dr. Weiss has called the "homely explanation for symptoms." To understand the attack of anxiety and its results, then, it is necessary to recall to patients the familiar phenomena of early childhood, such as a fright by a dog, being lost in a store or growing panicky in a fast moving elevator. The mother soon cures the anxiety and accompanying symptoms of breathlessness, palpitation and body discomfort in such cases. When the patient knows that anxiety is a familiar nonlethal phenomenon frequently present during growth and knows that he may cease worrying about illness in his body and start creating and acknowledging the kind of friendship, kindness and good will which cure childhood anxiety, then and only then does he get the right therapeutic attitude and begin to make progress. It is not easy educational work, but if mastered it is most important for the patient's welfare. It cures many, prevents others from chronic invalidism, and, finally, if some have to be referred for specialist treatment, it has started the treatment on a sound basis consistent with the philosophy of psychotherapy generally.

Dr. Sidney A. Portis, Chicago: It is difficult for those trained in the organic school of medicine to evaluate end results.

1. Margolin, S. G.: Personal communication to the author.

There is still a paucity of accurate measurements in this field. However, I think it is important to recognize there is no such thing as a neurotic patient. The patient's illness is interdependent on a disturbed physiologic balance in the body which is the result of altered stimulation of the nervous system originating in the higher emotional centers. We can no longer dismiss the complaints of these patients because we cannot find any organic evidence to substantiate the symptom complex. This is especially true in gastroenterology. If the average gastroenterologist cannot find organic evidence of disease to correlate with the clinical picture of the patient, he frequently gives the patient the "brush-off." I often wonder why this presumed hostility has developed in physicians and conclude it is because they do not have sufficient insight into the effect of emotional stimuli on body processes. The average gastroenterologist could honestly say that between 70 and 80 per cent of his office patients fall into a group in which there are no organic findings either from the laboratory or the roentgenologic point of view that can be correlated with the clinical picture. This important problem confronts all of us daily. An important factor in handling this type of patient is to gain his confidence. The patient should be told that he has no organic abnormalities at present but continued altered physiology may lead to subsequent organic changes. Peptic ulcer and ulcerative colitis may classically fall into this pattern. The patient must be impressed with the fact that the normalization of this so-called pathologic physiology will result in the relief of his symptoms. We must approach the patient's problem with a great deal of sympathy, tolerance and understanding. We must give him insight into the factors which led to the development of his disability. One can usually discuss early childhood patterns, life situations and environment and bring home to the patient that this disturbed emotional household has led to the development of the present symptom complex. I continually try to teach my interns, residents and associates in the office that they should be sympathetic to the life situations of the patient. At the outset it may be difficult for some physicians to gain the confidence of their patients when facing these problems because the patient soon learns that the doctor is not sure of his ground. However, as experience increases and sincerity develops, the problem becomes easier and the patient will develop a transference to his physician just as he does to his psychiatrist. Finally, it is important for the physician to recognize that a sympathetic history should be taken for the patients who have emotional complaints. The patient should at no time be aware that this point of view is uppermost in the mind of his physician. He then should be given the benefit of a thorough laboratory and roentgen investigation. With all these facts before him, the physician is in a much better position to advise the patient about his problem and the task will be much easier.

DR. HERBERT F. ROSS, Belleville, Mich.: There are definite psychic factors in functional and organic disease which are too often overlooked and ignored; nevertheless we should not fail in our treatment of the patient to give proper consideration to biologic and social factors which have to do with psychic reactions which in turn are associated with functional and organic diseases. In our revolution of environment from a rural agricultural to an urban industrial civilization there have been great changes to which we have not adjusted ourselves, one of which is our diet. In 1840, 55 per cent of the calories in the American diet were in unprocessed cereals, and according to Moore's "Pathology" there were 600 international units of vitamin B_1 in the average daily diet. Today, about 45 per cent of the calories are in cane sugar and processed cereals which contain about 50 international units of vitamin B_1. B_1 avitaminosis causes a disturbance of metabolism of carbohydrates and the accumulation of intermediary products, lactic and pyruvic acids in toxic amount. There may result functional and later degenerative changes in the central and peripheral nervous systems and general nutritional changes due to interference with the gastrointestinal function. Experimental thiamine deficiency in man causes fatigue, lassitude, anoxia, bradycardia, precordial pain, with electrocardiographic changes and changes in the personality of the subject. He is sensative and can not take criticism without showing considerable emotion. B_1 and other avitaminoses affect a person, especially at the age of puberty during the age of rapid physical growth. School children often make good records until the sixth or seventh grades and then begin to fail because of mental inadequacy as the result of thiamine deficiency. In three or four years they are so far behind their age group that they frequently become delinquent, start skipping school and are sent to the detention home for wayward children. Dr. Weiss mentioned that many women date their illness from the birth of their first child. Frequently psychical and functional disturbances are associated with the use of unsatisfactory contraceptive practices. This problem is much worse in our industrial urban civilization with its later marriages and lower birth rate than in the rural agricultural community with younger marriages and higher birth rates. Biologic and sociologic factors should not be overlooked in the use of psychotherapy.

DR. EDWARD WEISS, Philadelphia: I would suggest in closing that we listen rather than talk to our patients and that we try not to give advice on involved emotional matters, such as marriage and divorce. Then comes the question of missing organic disease. Somebody usually reminds me that in becoming interested in psychosomatic medicine one may overlook organic disease, not mentioning that an exclusive organic orientation leads to equally serious consequences in overlooking neurotic illness. Of course, as long as we are human, we are going to make mistakes. But if we plant one foot firmly in tissue pathology and the other foot firmly in psychopathology, then I think we have the correct balance for this approach.

ABNORMAL PRESENTATION

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The subject abnormal presentation necessitates a discussion of several abnormalities. In the limited time for this paper I will review only the salient points of each.

First, one should remember that every pregnant woman is entitled to a careful complete physical examination and accurate pelvic measurements early in pregnancy regardless of whether she is a private or a clinic patient. A careful pelvic examination may reveal abnormalities of the bony pelvis or soft tissues which often predispose to faulty presentation when the pregnancy is at term.

Routine examination of the patient's abdomen and the use of Leopold's four maneuvers during the last month or six weeks of pregnancy will enable any physician who is a careful observer to diagnose the position of the fetus before the onset of labor in most cases. When an abnormality is suspected, a roentgen examination of the mother's pelvis and the fetus is certainly indicated. Fetal abnormalities, as well as maternal abnormalities, predispose to abnormal positions. A fluoroscopic or roentgen examination may prevent an unnecessary operation done primarily in the interest of the baby.

Hydrocephalus can be diagnosed by roentgen examination, but some abnormalities of the soft tissues of the fetus may not be recog-

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nized until the labor is delayed and intrauterine examination is resorted to. I have seen 2 cases in which a large meningocele had to be perforated before the after-coming head in a breech case could be delivered. Enlargement of the fetal abdomen may be due to ascites, cysts of the kidneys, a distended bladder, enlargement of the liver and other organs.

Titus[1] said, "when there is hydramnion, the excessive fluid interferes with engagement, while in multiparas with relaxed abdominal walls this favors displacement of the presenting part." Falls[2] has called attention to abnormalities in the shape of the uterus as a cause of abnormal presentations.

Oblique presentation is usually transitory, and converts into either a longitudinal or a transverse presentation early in labor if not before. Whenever recognized in the latter months of pregnancy or early in labor, an attempt should be made by abdominal manipulation to change the oblique to a vertex presentation. When this procedure is attempted in the latter months of pregnancy the patient should then wear a form-fitted maternity corset or abdominal binder. Pads may be used to keep the head over the pelvic inlet.

Transverse presentation occurs when the long axis of the fetus crosses the long axis of the mother at about a right angle. Torpin[3] reported the incidence of transverse presentation as 1 in 615 in Negro women and 1 in 1,090 in white women. Titus,[1] Greenhill[4] and others stated that shoulder presentations occur about once in 200 cases, and more often in multiparas than in primparas. Stander[5] stated, "The existence of a transverse presentation in a primiparous woman is a prima facie evidence of a lack of accommodation, usually the result of disproportion between the size of the head and the pelvis, though occasionally it may be due to hydramnios." In multiparas, the most frequent etiologic factor is abnormal relaxation of the abdominal and uterine walls. Falls has shown that abnormalities in the shape and size of the uterus predispose to transverse presentation.

All authorities have agreed that transverse presentations are dangerous for both the mother and the baby. Prolapse of the umbilical cord is a frequent complication when the cervix is partially dilated and the membranes have ruptured. Labor is frequently prolonged and delivery difficult, resulting in a high fetal mortality. Maternal exhaustion, a tight uterus and finally rupture of the uterus occur frequently in the neglected cases of transverse presentation. This danger can be reduced by careful examination of obstetric patients late in pregnancy and early in labor. The pelvic measurements should be reviewed, cephalopelvic disproportion must be carefully looked for, and other abnormalities ruled out.

If the transverse presentation cannot be converted to a vertex, and there is some degree of pelvic contraction, cesarean section should be elected. This applies to patients who have not been contaminated by internal examination and those whose membranes have not ruptured. If the patient is seen after rupture of the membranes or the onset of labor, and she has a disproportion, but has not been contaminated by internal examination, membranes have been ruptured only two or three hours or she has been in labor six or eight hours and the fetus is still in good condition, she may be delivered by low cervical flap or extraperitoneal cesarean section.

When there is no disproportion, and the patient is in labor with some dilatation of the cervix and the membranes have ruptured but the uterus is not tight, a Braxton Hicks version, pulling down one or both feet, may shorten labor and reduce the danger of rupture of the uterus. Unfortunately, this procedure carries a high fetal mortality.

If the pelvis is normal, the baby not too large and the uterus well relaxed, a large Voorhees bag may be introduced with the hope of preventing prolapse of the cord and obtaining dilatation of the cervix. The delivery of the baby may then be completed by internal version and breech extraction. In my experience, this procedure has proved both dangerous and of limited value.

When a transverse presentation has been neglected, the uterus has become tight, the fetus is dead or in poor condition and the maternal pelvis is ample, decapitation of the fetus and extraction of the body, and then the head, may be the operation of choice. When the aforementioned conditions exist and there is real pelvic contraction, it may be necessary to do a cesarean section and hysterectomy. I think that rupture of the uterus is a real danger when a transverse presentation is present and neglected. Destructive operations on the fetus cannot be done without some danger to the mother.

Brow presentations are said to occur once in 1,500 cases. These presentations are usually transitory but frequently result in face presentations because of further deflexion. The treatment of a brow is intelligent expectancy unless there is disproportion between the fetal head and the maternal pelvis. When the latter condition exists, the baby should be delivered by cesarean section while it is in good condition and before the mother has become contaminated or exhausted.

Face presentation occurs once in 200 to 500 cases. The face presents when deflexion is carried to its highest degree. Fortunately, the majority of face presentations terminate

1. Titus, P.: The Management of Obstetric Difficulties, ed. 2, St. Louis, C. V. Mosby Company, 1940, p. 522.
2. Falls, F.: Diagnosis of Foetal Deformities in Utero, Am. J. Obst. & Gynec. 16:801, 1928.
3. Torpin, R.: Transverse Presentations, with a Report of Twenty-Four Cases Including One of Conduplicato Corpore, Am. J. Obst. & Gynec. 39:92, 1940.
4. Greenhill, J.P.: Principles and Practices of Obstetrics, ed. 9, Philadelphia, W. B. Saunders Company, 1947, p. 573.
5. Stander, H.J.: Textbook of Obstetrics, ed. 3, New York, D. Appleton-Century Company, Inc., 1945, p. 929.

spontaneously and without assistance. Again I emphasize a review of the pelvic measurements and a careful estimate of the fetal size, particularly the fetal head, to determine the cause of the presentation. If there is a true disproportion, the fetus should be delivered by elective cesarean section before the onset or early in labor.

When the chin is posterior with a face presentation, spontaneous delivery is impossible unless the fetus is small and the pelvis large. In a normal pelvis an attempt should be made to rotate the chin forward or change the position. If this fails and the uterus relaxes, the fetus may be delivered by internal podalic version and breech extraction after the cervix is fully dilated. If this is impossible and the baby and the mother are in good condition, delivery may be accomplished by cesarean section.

Breech presentation occurs in about 3 per cent of all deliveries. It is considered as abnormal because of the high fetal mortality resulting from it. The maternal mortality is not usually increased by breech presentation, but maternal morbidity is increased, and injuries to the maternal soft tissues do frequently occur in breech delivery.

The fetal mortality rate in breech presentation can be reduced and traumatic injuries resulting from breech delivery are usually preventable.

As in any obstetric case, accurate pelvimetry before the onset of labor and consideration of the attitude and size of the fetus will give valuable information to the obstetrician. When the baby presents as a breech in a patient with a borderline or slightly contracted pelvis, roentgen examination of the baby and the mother's pelvis will give information which is useful at the time of delivery. In a recent review of 236 consecutive breech deliveries, there was uncorrected stillbirth and newborn death rate of 5.46 per cent. When correction was made for babies with congenital deformities incompatible with life and babies who died in utero before the onset of labor, the combined mortality rate for both stillbirths and newborn deaths was 2.7 per cent.

I believe that the onset of labor should be spontaneous in cases of breech presentation whenever possible. The membranes should not be ruptured until the cervix is fully dilated. The fetal heart rate should be watched closely. Delivery should be with the mother under anesthesia, and body, shoulders and head of the baby should be guided through the pelvis even when the hips deliver spontaneously.

Delivery of the breech through the vagina should not be attempted until the cervix is fully dilated and retracted. In the presence of a normal pelvis, the second stage should not be permitted to be unduly prolonged before extraction of the baby. A wide episiotomy before delivery of a breech presentation reduces trauma to the baby and mother and decreases fetal mortality.

In assisting a breech delivery and whenever it is necessary to extract a baby presenting as a breech, I follow Potter's technic. Piper forceps are applied whenever the head cannot be delivered easily. The Celsus-Wiegand-Martin maneuver can be used to advantage in delivering the after-coming head through the pelvic canal whenever assistance is indicated.

When the fetus presents as a breech in a definitely contracted pelvis and there is cephalopelvic disproportion, an elective cesarean section should be done before the onset of labor.

DISAPPEARANCE OF CARCINOMATOUS ULCERATION OF BLADDER FOLLOWING URETEROSIGMOIDOSTOMY

Report of Two Cases

EDWIN DAVIS, M. D.
Omaha

It is my purpose to report the clinical disappearance of carcinomatous ulceration of the bladder following diversion of the urinary stream and to point out the possible biologic significance of this phenomenon in connection with the cause of certain tumors of the bladder. These observations are based on repeated cystoscopic studies confirmed by preoperative biopsy and by subsequent gross and microscopic examination of the excised bladder by competent pathologists.[1]

The obvious inference that these tumors were caused by a carcinogenic urinary ingredient is thought provoking and involves a consideration of the closely related subject of chemical carcinogenesis, which may be defined as "the production of malignant, transplantable, metastasizing new growths in laboratory animals or human beings by the action of cancer-producing chemicals introduced into the body, intentionally or inadvertently, by ingestion, inhalation, injection or cutaneous application" (Davis [2]).

Although having received but scant mention in other than special journals, the experimental achievements in this field during the past fifteen years have been little short of astounding. "Cancer may be produced at will in a majority of the animals treated, with a variety of chemical compounds" (Cook [3]), mostly prepared synthetically and of known molecular structure. Proved carcinogenic substances are exceedingly numerous and varied as to chemical structure and may be naturally occurring or synthetic, organic or inorganic and exogenous or endogenous in origin. There is evidence that carcinogens may masquerade unrecognized as innocent substances, resulting in chronic occupational, environmental, therapeutic or cosmetic contact. There is proof of the carcinogenic potency of certain artificial ingredients of foodstuffs (Cook and Kenna-

Read before the Section on Urology at the Ninety-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 11, 1947.

1. Dr. J. P. Tollman, Professor of Clinical Pathology, and Dr. H. E. Eggers, Chairman, Department of Pathology and Bacteriology, University of Nebraska College of Medicine.

2. Davis, E.: Chemical Carcinogenesis, Drugs, Dyes, Remedies and Cosmetics with Particular Reference to Bladder Tumors, J. Urol. 49:1-14, 1943.

3. Cook, J. W.: Carcinogenic Chemical Agents, Yale J. Biol. & Chem. 2:1-11, 1930.

way [4] and Reding [5]), and evidence has even been submitted directing suspicion against certain foodstuffs themselves, including glucose, sesame oil (Schiller [6]), wheat germ oil (Rowntree and others [7] and Rider [8]), olive oil and lard (Burrows and others [9]). Steiner and his associates,[10] after an extensive investigation as to "the possible carcinogenicity of over-cooked meats" and other substances, advised "further study of the carcinogenic potency of heated vegetable fats." Awaiting confirmation is the report (Widmark [11]) of carcinogenic substances obtained from roasted meat and browned butter. Eller and Wolff,[12] reviewing the literature, concluded that "the evidence that experimental tumors can be produced by a diet rich in vitamins is inconclusive," although they stated that the majority of authors consider vitamin excess to be a factor in tumor initiation and tumor growth.

In addition to these multiple exogenous sources, carcinogenic properties have also been ascribed to certain endogenous (physiologic) substances produced within the body, acetylcholine and estrogens being among these. For instance, Hall and Franks [13] reported "an inordinate number of tumors which developed in various animals" during prolonged administration of acetylcholine. Cramer [14] considered the carcinogenic potency of estrogenic substances in the production of mammary cancer in mice, discovered by Lacassagne [15] to be "based upon evidence which is incontrovertible." Eller and Wolff, reporting a certain commercial estradiol-containing face cream which "produced cancer in animals, as well as other profound systemic changes, when applied on the skin in one-fifth the amount recommended for daily use by women," have quoted numerous warnings from authoritative sources against indiscriminate, prolonged use of estrogen-containing ointments. The chemical grouping known as the phenanthrene nucleus, possessed in common by the most potent of the carcinogenic hydrocarbons, is "widely distributed in nature in a variety of physiologically important compounds, including cholesterol, vitamin D, the bile acids and the sex hormones" (White [16]). Auchincloss and Haagensen [17] have commented on the unrestricted and promiscuous use of estrogenic substances in cosmetics. Moreover, this topic has been considered of sufficient importance to have appeared in the editorial columns of THE JOURNAL,[18] in which a distinct note of warning has been sounded. Supporting the work of Steiner,[19] who demonstrated the sporadic occurrence of carcinogenic substances in human liver (20 per cent of specimens examined), Hieger [20] has recently reported "a sarcoma-producing fraction—obtained from mixed lung-kidney-muscle of cancerous and non-cancerous human (autopsy) subjects."

This array of seemingly irrelevant and unrelated facts, indicating the multiplicity, variety and ubiquity of carcinogenic substances, is submitted by way of evidence that the idea of a carcinogen as an ingredient of human urine, either exogenous or endogenous in origin, is by no means fantastic and has in fact ample precedent. The so-called aniline bladder tumor of workers in dye factories which has been long recognized and whose identity and cause has been established beyond question, serves as a classic example of a new growth due to a carcinogen of exogenous origin inadvertently assimilated in infinitesimal daily dosage, through a long period of years by ingestion, inhalation or inunction. The brilliant achievement of Hueper [21] and his co-workers, who succeeded in the production of bladder tumors in dogs by feeding beta-naphthylamine (one of the "intermediates" in the synthesis of aniline dyes), has afforded incontrovertible experimental proof substantiating the mass of clinical evidence concerning the cause of these tumors. The amazing feature is that "aniline tumors" should be produced in an organ remotely removed from the point of contact with the carcinogen and nowhere in the body except in the urinary tract. Concerning the two schools of thought as to whether the contact of the carcinogen (or its "organic conversion products") with the epithelium of the bladder is via the urine or via the blood stream, Hueper [22] has cited evidence to show that "the majority of investigators" believe that the urogenous route is implicated. This opinion is in keeping with the known characteristics of tumors of the bladder and with the evidence herein presented.

The strange "habits" of tumors of the bladder, characterized by a strong tendency to multiplicity and to repeated reappearance (as distinguished from recurrence) elsewhere in the bladder following transurethral destruction, are familiar to all. It was reflection on this unconventional behavior of bladder papillomas, as well as on the extraordinary and intriguing facts in connection with "aniline bladder tumors" suggesting a urine-borne carcinogen, which stimulated my interest in chemical carcinogenesis. As long ago as 1942 I presented before the American Urological Association [3] a review of achievements in this field together with evidence justifying the hypothesis that the genesis of certain "spontaneous" tumors of the bladder might bear a relationship to unrecognized carcinogens masquerading as innocent substances and encountered through environmental or occupational contact or included among the endless list of drugs, remedies, cosmetic concoctions, synthetic vitamins and sex hormones and

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5. Reding, R.: Des dangers, de cancérisation résultant de l'emploi de colorants dans l'alimentation et en thérapeutique, Acta Union internat. contre cancer 4:735, 1939.
6. Schilling, W.: Rat Sarcoma Produced by the Injection of the Dye, Light Green P. S., Am. J. Cancer 31:406, 1937.
7. Rowntree, L. G.; Steinberg, A.; Derrance, G. M., and Cicconi, E. P.: Sarcoma in Rats from the Ingestion of a Crude Wheat Germ Oil Made by Ether Extraction, Am. J. Cancer 31:350, 1937.
8. Rider, D. L.: An Experiment in Feeding Wheat Germ Oil Prepared by Ether Extraction, Am. J. Cancer 33:275, 1940.
9. Burrows, H.; Hieger, I., and Kennaway, E. L.: Experiments in Carcinogenesis: The Effect of the Subcutaneous and Intra-Peritoneal Injection of Lard, Olive Oil and Other Fatty Materials in Rats and Mice, J. Path. & Bact. 48:619, 1939.
10. Steiner, P. E.; Steele, R., and Koch, F. C.: The Possible Carcinogenicity of Overcooked Meats, Heated Cholesterol, Acrolein, and Heated Sesame Oil, Cancer Research 2:100, 1942.
11. Widmark, E. M. P.: Abstracted, Science News Letter, 38:388, 1939.
12. Eller, J. J., and Wolff, S.: Hormones and Vitamins in Cosmetics, J. A. M. A. 114:1865 (May 11) 1940; also 2067 (May 18) 1940.
13. Hall, C. E., and Franks, W. R.: Physiological Carcinogenesis, J. Biol. Chem. 125:ix, 1938.
14. Cramer, W.: The Hormonal Aetiology of Breast Cancer, Am. J. Cancer 33:463, 1940.
15. Lacassagne, A.: Apparition du cancers de la mamelle chez la souris male, soumis à des injections de folliculine, Compt. rend. Acad. d. sc. 194:630, 1932.
16. White, A.: Carcinogenic Substances, J. Connecticut M. Soc. 3:4, 1939.
17. Auchincloss, H., and Haagensen, C. D.: Cancer of the Breast, Possibly Induced by Estrogenic Substance, J. A. M. A. 114:1517 (April 20) 1940.
18. Contraindications to Estrogen Therapy, editorial, J. A. M. A. 114:1360 (April 20) 1940.
19. Steiner, P. E.: The Induction of Tumors with Extracts from Human Livers and Human Cancers, Cancer Research 2:425, 1942.
20. Hieger, I.: Carcinogenic Substances in Human Tissues, Cancer Research 2:657, 1942.
21. Hueper, W. C.; Wiley, F. H., and Wolfe, H. D.: Experimental Production of Bladder Tumors in Dogs by Administration of Beta-Naphthylamine, J. Indust. Hyg. & Toxicol. 20:46, 1938.
22. Hueper, W. C.: "Aniline Tumors" of the Bladder, Arch. Path. 29:856 (June) 1940.

the countless aniline dyes used in the coloring of foodstuffs and fabrics.

In the discussion following the presentation of this paper Dr. Robin Pearse,[23] of Toronto, Canada, at my insistent request, reported "two cases of marked regression of infiltrating papillary carcinoma of the bladder occurring after the bladder had been at rest." Although it is not clear whether it was his purpose to emphasize the resting bladder or the absence of urine as the causative factor and although preoperative confirmation at biopsy was lacking, the evidence submitted by Dr. Pearse of the relationship between ureterosigmoidostomy and "regression" of the tumor is to be viewed as impressive.

It was a consideration of these pertinent and intriguing facts which prompted speculation as to what might have occurred as the result of diversion of the urinary stream and which led to cystoscopic examination in the first case after a fifty day interval from the time of ureterosigmoidostomy.

REPORT OF CASES

My own observations on two "phantom" tumors were so essentially similar as to render separate detailed reports unnecessary. The patients were both men, aged 56 and 60 respectively, and each complained of hematuria without other symptoms or physical symptoms of significance. In neither case could the tumor be made out by combined rectal and abdominal palpation under spinal anesthesia.

Preoperative cystoscopic examination in the first case showed a rounded, crater-like ulceration, about 2 cm. in diameter and with an elevated edge, situated just behind the trigone and to the left of the midline. In the second case it was not possible to distinguish positively by cystoscopic inspection alone between inflammation and new growth. This lesion, situated on the left lateral wall of the bladder and being 2½ cm. in diameter and slightly elevated, showed an edematous-looking, reddened surface but no actual ulceration and no papillary processes. The rest of the bladder was normal in each case.

Preoperative biopsy specimens, removed with the resectoscope, in each instance were reported as showing the presence of carcinoma. In the second case Dr. Tollman and Dr. Eggers concurred in the opinion that the histologic picture was that of a highly malignant type of carcinoma.

Bilateral ureterosigmoidostomy in each instance was uneventful with respect to both technic and convalescence.

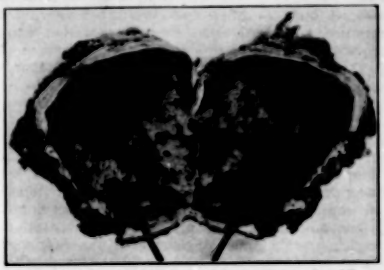
Postoperative cystoscopic inspection, carried out by my associate, Dr. Lee, and myself with caudal anesthesia, with excellent illumination and with excellent cooperation on the part of the patient, showed the bladder mucosa to be perfectly normal throughout after postoperative intervals of fifty and seventy-one days respectively. There was no indication that these were the same bladders previously visualized.

Postoperative biopsy, performed in 1 case only, showed cancer cells situated in the underlying muscle tissue of a deep bite of normal mucosa removed at the site of the previous ulceration with the resectoscope loop.

Cystectomy, performed with the patient under continuous spinal anesthesia, in each instance was uneventful as was convalescence.

The pathologic reports likewise were strikingly similar. In each case careful gross inspection of the excised bladder showed no evidence of intravesical new growth or extravesical extension. However, microscopic section of the wall of the bladder showed cancer cells in the tissues underlying the normal mucosa in each case.

In case 1, as reported by Dr. Tollman, "section of the wall of the bladder showed massive invasion by tumor, which in most places appeared as large unorganized masses of cells, with small areas at intervals showing distinct glandular formation." The diagnosis was adenocarcinoma of the bladder.



Sagittal section of specimen removed at cystectomy (case 2).

In case 2 " sections were taken at several points including the full thickness of the bladder wall. One of these sections showed residual tumor cells similar to those in the earlier biopsy specimen. " The diagnosis was papillary carcinoma of the bladder.

In response to follow-up inquiry each patient reported himself symptom free at the end of three and fourteen postoperative months respectively.

COMMENT

It is to be clearly understood that it is not my purpose to advocate ureterosigmoidostomy as a therapeutic or curative measure but rather to direct attention to the possible biologic significance of this phenomenon. It is true, however, that in cases in which the bladder tumor is not amenable to recognized methods of treatment diversion of the urinary stream may provide a gratifying degree of symptomatic relief and, incidentally, an opportunity for observation and for accumulation of data, and to this end cystoscopic examination after ureterosigmoidostomy is urged.

Since ample experimental and clinical evidence has been cited to provide precedent for the presence of a carcinogen (exogenous or endogenous in origin) as an ingredient of human urine, it is to be hoped that interest stimulated by these observations may further the knowledge concerning the origin of certain tumors of the bladder. The fact that cancer cells were shown to persist in the deeper tissues does not detract from the biologic significance of the complete disappearance of the intravesical portion of the tumors. In the event that the inference concerning a urine-borne carcinogen is correct,

23. Pearse, R., in discussion on Davis.[2]

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the possibility of confirmation by the development of tumors of the rectosigmoid after ureterosigmoidostomy is to be anticipated.

ABSTRACT OF DISCUSSION

DR. WILLIAM P. HERBST, Washington, D. C.: Recently it has been our opportunity to observe the influence of a chemical substance on hopeless malignant growths of the urinary tract. We have used inositol, which is one of the members of the B complex group, and up to the present we feel slightly encouraged by the responses on the part of the bladder tumors. We used it on extensive growths and in inoperable cases. We felt that there was a definite improvement in the clinical course of the 4 or 5 patients on whom it was used, and several of them were able to leave the hospital and come back into the outpatient department for periodic observation. It is worthwhile to give testosterone to a patient who is to have a suprapubic operation preliminary to prostatectomy. You all have patients who do not see how they are going to submit to a prostatectomy, and frequently 25 mg. of testosterone will make that patient want to go ahead with the operation. We now have recognized psychogenic amenorrhea. We know from the British, who have done prefrontal lobotomy, that the ketosteroid level in the patients is zero before prefrontal lobotomy and that after prefrontal lobotomy, it becomes normal and the patients resume a more normal general physical activity. When we delve into this subject of chemistry as related to malignant processes, we should think of the psychic status of the patient and its chemical relationship, and we should strive to find more substances which will be on the other side of the list, which Dr. Davis has so excellently presented to us.

DR. ARMANDO TRABUCCO, Buenos Aires, Argentina: I should like to add another case to Dr. Davis' report. I performed an anastomosis of the intestine and when I took out the bladder I found no tumor present. A biopsy report six months previously had reported evidence of a papillary carcinoma of the bladder, situated on the right lateral wall and surrounding the bladder neck, but I found that both the bladder and the wall were free of tumor.

THE TREATMENT OF ASTHMA

A Panel Discussion

J. HARVEY BLACK, M.D., Moderator
Dallas, Texas

STATUS LYMPHATICUS

DR. GEORGE PINESS, Los Angeles: Status asthmaticus or intractable asthma is an asthmatic condition that does not respond to the ordinary methods of treatment. The etiology is limited: (1) home medication, (2) overmedication and (3) lack of fluids and food. The first and most important therapy is the amount of fluids that patients should receive. Patients can take fluids by mouth, but it does not seem to answer the purpose; they should be given as much fluid as they will take by mouth. The use of fluids intravenously or subcutaneously is more effective. I doubt that any of us realize the amount of dehydration that occurs in the asthmatic person who has been in attack for several days or weeks. The large amounts that I advocate are based on the evidence of having measured and observed patients who have had this condition and the amount that they could take. The average patient requires initially from 3,000 to 5,000 cc. per twenty-four hour period. I usually use distilled water with 5 per cent dextrose. Dr. Unger believes that aminophylline is satisfactory in continuous intravenous therapy in these asthmatic patients. My experience has taught me that it has no value. Aminophylline, in my opinion, is one of the most disappointing drugs in the treatment of status asthmaticus. Usually, if and when it does give relief, it is for a short period, is spectacular and does not last. The patients require mental and physical rest, the type of physical rest that can be best obtained by the avoidance of narcotics such as meperidine hydrochloride ("demerol hydrochloride" N.N.R.) opium tincture and morphine. The best sedative available is chloral. It is the only one I know of that has no effect on respiration. It does not depress. A small dose of phenobarbital is not objectionable. I have never found it to give any trouble in small doses. I do not believe it advisable in large doses. Potassium iodide is still the best drug that we have in addition to fluids. Without the addition of fluids, it has little value except to upset the patient. Iodides, given by mouth if possible and, if that is impossible, given intravenously, may be prescribed in sufficient dosage to assist in liquifying the secretions that these patients have and are unable to eliminate. Without fluids, it is impossible to thin out these secretions. Epinephrine has lost its value at that stage, but if it is continued over a period of time it can be used with effectiveness once again. I have found that when epinephrine is discontinued, caffeine acts as a satisfactory drug in that it is a pulmonary stimulant, perhaps extremely mild, but it does do something to stimulate the patient. In addition, hygienic and dietary care are necessary. If possible and if the etiology is known, it should also be attended to.

PENICILLIN AEROSOL SPRAYS

QUESTION: What is your opinion of penicillin aerosol sprays? Is there a simple method of administering them without the use of expensive equipment?

DR. PINESS: My experience with penicillin sprays is limited. I have seen patients who had penicillin reactions resulting from penicillin sprays. I have never seen a patient who had any permanent measure of relief from it, but I have seen the sad and extensive reactions that have occurred from it. I can see few indications for penicillin in bronchial asthma, with the exception of secondary infections with bronchiectasis or perhaps small pulmonary abscesses. I cannot see any advantage in the use of penicillin by spray or otherwise in bronchial asthma without the secondary infections.

DUST EXTRACTS

QUESTION: Please discuss the use of high dilutions in the treatment with dust extracts.

DR. PINESS: I am one of the few who do not believe in dust stock antigen. In most cases we can still determine the specific thing in the environment to which the patient is sensitive and perhaps are able to remove that offending substance or, if necessary, treat with the specific antigen to which the patient is sensitive.

OXYGEN

QUESTION (Dr. J. Harvey Black, Dallas, Texas): Do you ever use oxygen at all with your asthmatic patients?

DR. PINESS: I do not use oxygen. I do not believe that the patient who has asthma, unless he has cyanosis, requires oxygen. Most patients have difficulty getting rid of their air instead of getting it. Rarely does one see an asthmatic patient gray and cyanotic with shock, unless it is an acute shock resulting from therapy or contact with specific antigen. I see no reason to use either oxygen or helium in status asthmaticus or in any other type of bronchial asthma.

ASPIRATION

DR. LOUIS TUFT, Philadelphia: I want to make an additional suggestion. In patients with status asthmaticus who do not respond to the usual measures, my associates and I have found bronchoscopic aspiration to be a valuable adjunct in hospital treatment. It is well worth while considering when other measures fail.

DR. PINESS: In my experiences it is a rare occasion when the bronchoscopist can pull out that cast in the bronchus that results from the patient's being dehyrdrated and in status asthmaticus.

DR. CHARLES H. EVERMAN, St. Louis: Carrying on Dr. Tuft's idea, I have thought that some persons with status asthmaticus did better by mere tracheal aspiration, without the trouble of bronchoscopic aspiration. The treatment of patients with status asthmaticus should be on a physiologic basis, and each clinician has his own methods to attain these; namely, hydration, sedation and bronchodilatation.

PSYCHOGENIC ASTHMA

QUESTION: What percentage of asthma is wholly and what percentage is partly psychogenic, as seen in general practice?

Presented before the Section on Miscellaneous Topics at the Ninety-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1947.

DR. EVERMAN: The psychogenesis of bronchial asthma is an old concept, and this question cannot be answered on a percentage basis without a review of the historical background. The psyche attends all of us at all times in health and in disease. In situations of either health or disease which have a connotation of hopelessness or of doubtful outcome, the psyche will be accentuated. This is particularly true in bronchial asthma because of the inherited significance of breathing, which is one of the most deeplying and fundamental of vital functions. Undoubtedly, the pathologic change is due to an etiologic agent, but just as certainly are the nuances of symptoms due to the disposition, temperament and personality of the patient. Here is the source, of our confusion, both psychosomatists and allergists, for in many patients we are unable to correlate the intensity and the severity of the symptoms with the results of our physical examination and with our concept of the immunologic mechanism. Psychologic factors or psychologic stimuli induce wheezy breathing along facilitated pathways only in persons who have had the pattern of wheezy breathing already established by allergy.

SINUS INFECTION

QUESTION: How often is asthma due to sinus infection and suppuration?

DR. EVERMAN: I do not know, but I believe the figures are given as about 50 per cent in adults and less in the younger decades. The mere expectoration of purulent secretion does not indicate per se that wheezy breathing was due entirely to plugging of the tracheobronchial system by purulent secretion; I am sure that it is the experience of all of you that persons hypersensitive to an allergen who previously always had what was called a cold, with wheezy breathing, while avoiding that allergengo through infections of the upper and the lower respiratory tract without wheezy breathing. The percentage goes up as one gets older, and then infection is the sole cause. The question on the value of positive pressure therapy with and without helium and oxygen mixtures in status asthmaticus has been answered by the discussion of Dr. Piness. My reaction to that question is that oxygen is used in those persons who have clinical evidence of anoxia. The addition of helium makes it easier for them to breathe. We have had to get along without helium, and those persons who needed oxygen seemed to get along all right without it.

PROLONGED ETHER ANESTHESIA

QUESTION: What experience has there been in the treatment of asthma by prolonged ether anesthesia, and may this be used for asthma of infectious origin?

DR. EVERMAN: The only instance in which I have used ether anesthesia has been in intractable asthma. The ether in these instances has been used both by inhalation and by rectal instillation. When used by inhalation, of course it was not with the usual preanesthetic administration of morphine and atropine. When it is so used, such persons have come out of their status asthmaticus. The relief was due to the great amount of expectoration that was induced by ether inhalation anesthesia without preliminary atropine.

TEMPERATURE AND HUMIDITY

QUESTION: What temperature and humidity are best for the asthmatic person to live in, or does this vary from patient to patient?

DR. EVERMAN: I think that it does vary from patient to patient. Certainly those persons in whom infection appeared to be the dominant element seemed to do better in a dry and hot climate. They also have seemed to do well in a dry and cold climate. Further than that, I do not see any more accurate reply.

AGE, POSITIVE PRESSURE, HUMIDITY

DR. PINESS: My experience has been that most of these people who have sinus infection after the age of 40 are usually patients who have had asthma or some other allergic manifestation of the respiratory tract for many years prior to the infection. Regarding the positive pressure therapy in asthma, my associates and I have had experience in only 2 patients. The sad part about it is that the anesthetic department in the hospital in which the positive pressure therapy was given insisted that the patient be given "demerol" before they would give the oxygen. The "demerol" was repeated on two occasions, and the patient, a young woman of about 25, died. I can see no advantage to the therapy. I had nothing to do with prescribing it. As far as humidity is concerned, I think on the West Coast, Arizona, New Mexico and California, where humidity is low, we find that patients who come from the East have just as much trouble as they had in their home towns. Hence, I do not advise anyone to send them to California if it is just for the sake of the humidity.

PSYCHONEUROTIC FACTORS

DR. LOUIS TUFT, Philadelphia: I would like to say something about the psychoneurotic factors in asthma. When the term "psychosomatic" or "psychoneuroses" is mentioned at present, one immediately thinks of a subconscious element along freudian lines that has to do with asthma. One forgets too often a simple form of emotional disturbance that makes many persons with asthma worse. That is the element of fear, particularly in patients who are having asthma for the first time. Patients with asthma react in different ways to fear, just as patients do to pain. Libman pointed out years ago that the patient's reaction to pain will vary from one of complete hyposensitization to one of extreme hypersensitiveness. The same situation exists in asthmatic patients. Some will take the attack in their stride and accept it as something that they have to tolerate. But many asthmatic patients become extremely alarmed, nervous and upset, and unfortunately they are the ones who are given sterile hypodermic injections for relief. When the sterile hypodermic injection affords relief they immediately are classified as psychoneurotic. We physicians would do much more for asthmatic patients if we would spend more time in quiet reassurance and in trying to allay their fears rather than, as has been my experience with some psychiatrists, to ask them many personal questions which are unrelated to their asthma and which only create antagonism.

TEMPER TANTRUMS

DR. BLACK: A small boy had asthma and had learned that he could throw himself into a temper tantrum and produce an attack of asthma. So, when his mother threatened him with corporal punishment, he threatened her with asthma, and he had her effectively blocked off. We found some definite substances to remove from his diet and his environment. Then he found that he could throw his temper tantrum when he wanted to, but he could have no asthma. He cordially hates me because his mother now spanks him. I think that is a good illustration of the influence of psychic reactions on allergic mechanisms.

GAY TREATMENT

QUESTION: What about the so-called Gay treatment for bronchial asthma from Biloxi, Miss.?

DR. TUFT: As Dr. Unger told you, the essential basis of it is drug therapy. I have just been handed the formula by Dr. Piness. It consists of potassium iodide, tincture of digitalis, potassium arsenite solution U. S. P., and phenobarbital sodium. He gives sodium dehydrocholate or dehydrocholic acid, "calmulsion" (a liquid preparation of dicalcium phosphate and vitamin D) or calcium lactate, and a cathartic, usually cascara. Thirty or forty years ago we heard about a remedy that was being distributed in Buffalo. The essential basis of that was potassium iodide. Attention now apparently is being directed to Biloxi, Miss. I think that any benefit which these patients get undoubtedly is due in part to the drugs, especially to potassium iodide and possibly the arsenic, but also to the all-important factor of change of environment. The latter releases these patients both by taking them away from their environmental allergens and either as a form of psychotherapy or as a combination of both.

RADON TREATMENT

QUESTION: What is the general opinion of the radon treatment of Gay and his associates?

DR. TUFT: This refers to Lesley Gay, who reported this along with Dr. Crowe, who originated the treatment for deafness. During the war this investigation was made on aviators who experienced auditory impairment when they were up in the air, apparently as the result of the collection of lymphoid tissue in the nasopharynx. The treatment then consisted in the insertion of radium or radon seeds or in roentgen therapy. Both methods have been used, but I am not prepared to discuss the advantages or disadvantages or to say which method is prefer-

able. Since many asthmatic children have a persistent lymphoid hyperplasia in their nasopharynx even though their tonsils and adenoids have been removed, attempts have been made, therefore, to get rid of the lymphoid collection in the nasopharynx by use of radium or roentgen therapy instead of surgical treatment.

LYMPHOID TISSUE

QUESTION: Is the lymphoid tissue cause or effect?

DR. TUFT: I presume the questioner has in mind whether it is cause or effect in relation to the asthma. That is debatable. Lymphoid hyperplasia is considered by some as being part of the allergy picture, and therefore probably may be causal. If the lymphoid tissue is large enough to cause obstruction, it may induce asthma reflexly, and under those circumstances should be removed by means of radon, roentgen rays or surgical treatment. Whether the effect of radon is specific or nonspecific is difficult to answer. The current belief is that if it affects or benefits the asthma, it does so through its nonspecific effect, just as roentgen treatment of asthma given over the posterior part of the thorax, the spleen or the long bones sometimes temporarily helps the asthmatic patient, presumably through a nonspecific protein effect.

SECTION OF SYMPATHETIC OR PARASYMPATHETIC DORSAL NERVES

QUESTION: Please discuss surgical or chemical section of the sympathetic or parasympathetic dorsal nerves in asthma.

DR. TUFT: As with any chronic intractable disease, asthma likewise has run the gamut of many suggested remedies. One of these was blocking of the parasympathetics either by means of alcohol or by surgical resection of the pulmonary plexus. This is a radical procedure fraught with considerable danger. If I remember correctly, perhaps 15 per cent or more of those patients died either at the time of the operation or not long afterward. I do not remember the exact percentage, but it is high enough to show that it is a radical and dangerous procedure and should not be prescribed for the average patient. I think that Dr. Gay would probably agree that it should be used only as a last resort and that the patient should be warned about the limited possibilities of eventual cure or remission. Some patients, however, did get remissions for periods varying from six months to several years.

DIET FOR PATIENT WITH ALLERGY

QUESTION: Is there any basis for the theory that an asthma due to any allergen may be aggravated by any other protein? Therefore, should a diet high in carbohydrate and low in protein be recommended in treating such a patient?

DR. TUFT: I am not sure what this questioner has in mind. I suppose he means, if a patient is allergic to one food, should you remove other protein foods from the diet? I do not think that is necessary. As a rule, if there is specific sensitization, it is to one food or to a member of a food group, rather than to all protein foods. I do not think that I would recommend a diet low in protein and high in carbohydrate.

SUMMARY

DR. ROBERT A. COOKE, New York: I shall try to sum up the discussion on the treatment of asthma. There are two phases to the treatment. One is symptomatic, the other is etiologic or against the cause itself. Symptomatic therapy is based on the physiologic procedures of getting air into the lungs and clearing the bronchi. One method is to loosen the tenacious secretions in the bronchi. The drug par excellence for that is iodide. When a rapid effect is needed the sodium salt may be given intravenously. Aminophylline, in my experience, gives relief to many patients with severe asthma. The rectal administration of 8 to 10 grains (0.5 to 0.6 Gm.) either in solution or as a suppository often assures a night's rest. Given intravenously, it is more promptly effective. Ephedrine (orally) and epinephrine are the drugs of choice. Epinephrine (aqueous) may be used in a spray or for injection. For prolonged effect injections of epinephrine in oil or gelatine are recommended. Bronchoscopic examination should be done only on selected cases, as effective aspiration of mucus is not easily secured in this way. Possibly the preliminary treatment and medication may be as effective as the actual aspiration. The old fashioned use of ipecac syrup should not be overlooked. The bronchi are better emptied by the act of vomiting, which tends to express the mucous plugs from the bronchi more effectively than does the act of coughing. Rest is essential. Chloral hydrate, paraldehyde or codeine for the cough are helpful drugs but should not be used to the point of decreasing respiration or depressing the center. Nutrition is another important factor. Attention should be paid to fluid intake, minerals and other essential foods. Severely asthmatic patients may do well on intravenous injections of amino acid products and dextrose (2 liters in twenty-four hours) only for one to two days. The diet is then increased to the point of caloric adequacy. Aside from symptomatic measures, treatment should be directed against the cause or against the allergic factor. This means above all a correct diagnosis. Many factors may be responsible for the asthma. Inhalants, foods, drugs and infection may act alone or in combination. I believe that food is not as frequent an excitant as inhalants or infection, but if there are food allergens they should be determined and eliminated. Whether or not infection acts as a primary excitant, it is certain that infection is important in producing asthma. For that reason the antibiotics and the sulfonamide drugs by their effects on acute and chronic infections of the respiratory tract play an important role in controlling asthma. Education and the cooperation of the patient are necessary. Emphasis should be placed on the fact that asthma is not outgrown but that the earlier the patient is seen, given a correct diagnosis and treated, the better the results will be.

Special Article

PRIMARY CARCINOMA OF THE LUNG

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This article is the twelfth of a series to be published by the American Medical Association in cooperation with the American Cancer Society. The series is designed to aid in the early diagnosis of cancer and thereby to gain more effective results in treatment.

Primary carcinoma of the lung is a common disease that is usually not difficult to detect even in its early stages. The constructive results of surgical extirpation are favorable when compared with other visceral malignant tumors, and, more important, steady improvement is being recorded. In the past decade the medical profession has made real progress toward earlier diagnosis of this disease, and there are many reasons to believe that the time lag between onset and recognition will be still further reduced. During the same period many of the technical obstacles to the successful surgical management of pulmonary cancer have been surmounted. The operative mortality rate at first appeared formidable because advanced and oftentimes hopeless cases were being approached with technics that were inadequate at the best. As technical problems were solved and more favorable stages of the disease recognized, the operative hazards have been reduced correspondingly.

The problem of primary carcinoma of the lung is now that encountered in all efforts for cancer control—earlier diagnosis. It is doubtful that more radical surgical treatment can be devised that can materially improve results, although further perfection of technics and supportive measures may gain even better immediate results in the poor risk patients that now make up the small group that succumb after operation. There are relatively few patients today who do not have a reasonable chance of weathering a radical removal of the primary growth

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provided the disease is still localized when surgical treatment is undertaken.

Many aspects of pulmonary cancer that are recorded in the vast literature on the subject are of interest only to students of this particular lesion. I shall consider only certain practical aspects of diagnosis and management that are vital to further progress in the control of the disease. They should be of interest to every doctor, if for no other reason than that he himself is a likely candidate for cancer of the lung. Pulmonary cancer is almost as common as cancer of the stomach, and its greatest incidence is in men (80 to 85 per cent) between the ages of 40 and 70.

PREVENTION

Nothing is known about the cause of the disease that can be translated into effective preventive measures. It is possible that an actual increase in the incidence of pulmonary cancer has taken place during the first half of this century. Several statistical studies support such an interpretation. On the other hand, Boyd,[1] who is in a position to speak freely of the shortcomings of pathologists, thinks the disease was not recognized twenty years ago because it was not looked for. At any rate, evidence that pulmonary cancer was on the increase led to several speculations about causative agents, and among other things, cigarette smoking was incriminated. Further knowledge about the nature and the mode of action of carcinogenic agents, and a careful recording of the smoking habits of ample numbers of patients with the disease, provide no factual evidence on which advice to give up smoking for this reason can be based. Exposure to radioactive ores has been correlated with a high incidence of the disease in classical studies on European mine workers. It may be well to bear this in mind.

DETECTION IN APPARENTLY WELL POPULATION

At the present time there is only one practical way to go about detecting early pulmonary cancer in the apparently well population, and that is by roentgen screening. This method will disclose silent neoplasms in the periphery of the lung. The increasing use of roentgen screening as a public health measure for tuberculosis case finding is bringing a few of these asymptomatic cases to light. It will not disclose the early endobronchial growths that have not as yet encroached on the lumen of the bronchus. When bronchial obstruction occurs, symptoms usually bring the patient to the doctor.

However, the age and sex group of men between the ages of 40 and 60, wherein lies the greatest incidence of pulmonary cancer, is probably the most difficult to secure in routine tuberculosis screening. Also, the repetition of the examination at intervals, a precaution necessary in an effective cancer control program, is beyond the range of necessity in checking for active tuberculosis. About all a physician can do to exclude cancer of the lung in a periodic health examination is to inquire about symptoms that may be pertinent and secure a roentgen examination of the chest, preferably by fluoroscopy.

DETECTION BY EARLY SIGNS AND SYMPTOMS

The early symptoms of pulmonary carcinoma are so commonplace that they may not be taken seriously either by the patient or his physician.

Cough.—Cough is the first symptom in over half the cases and a common (90 per cent) manifestation in later stages; but every one coughs, more or less. Patients may be unaware of the fact that they cough. This complaint always should be explored with the query whether there has been a notable change in the cough habits. It is the cough that "hangs on" in an unaccustomed manner that should alert the physician. He should not be misled by the patient who "drops by" to ask for a cough medicine. An acute infection of the respiratory tract oftentimes (10 per cent) provokes the first signs and symptoms of bronchial obstruction. The event may pass clinically as mild pneumonia that responds promptly to chemotherapy or subsides spontaneously. Whether or not a roentgen examination is deemed necessary during the acute phase, it is essential that localized pulmonary infections be followed by roentgen examinations until the lung fields have cleared. A persisting shadow, or one that shows collapse of a segment of lung, indicates further efforts toward diagnostic investigation.

Hemoptysis.—Hemoptysis, when it occurs (5 per cent as a first symptom, and sooner or later in 40 to 50 per cent of cases) is always an indication for thorough diagnostic study. Blood in the sputum in the early stages of pulmonary cancer usually does not take the form of a brisk or profuse hemorrhage. It is more comparable to the small trickle of blood that is detected as "occult" in lesions of the gastrointestinal tract. In the sputum the amount of blood seems insignificant; the regularity and persistence of its appearance are highly significant. Hemoptysis is likely to be the symptom that brings the patient to the physician (30 per cent).

Loss of Weight.—Loss of weight is surprisingly common and many times seems out of proportion to the size and nature of a tumor that is still localized. Loss of weight need not be interpreted as a sign that the tumor has disseminated but, of course, becomes accentuated as the disease progresses.

Pain.—Pain (50 to 60 per cent) when severe is usually a symptom of extension to the parietal or mediastinal pleura. It suggests invasion of the intercostal nerves or the first dorsal root of the brachial plexus. A constant dull pain referred to the back is presumptive evidence of mediastinal invasion and as such points toward an inoperable stage of the disease. Discomfort and other sensations arising in the chest for which the patient cannot always find adequate verbal expression are often described as pain, but not of real severity. They may arise from an inflammatory reaction, the distortion produced by partial atelectasis or from mediastinal involvement.

Wheeze.—The noting of a wheeze (10 to 15 per cent) may be an early symptom that is oftentimes transient. It differs from the wheeze of asthma by being localized as unilateral both by the patient and the examiner.

Pulmonary Osteoarthropathy. — Pulmonary osteoarthropathy with clubbing of the fingers and joint pain is usually a late manifestation, but may be the presenting symptom of a slowly growing and otherwise silent cancer.

Pleural Effusion.—Cancers that originate in the periphery of the lung are oftentimes asymptomatic until they extend to the pleura and spread by dissemination in the pleural space. This event is manifested by pleural effusion, dyspnea and at times pleural pain or discomfort. While it may be the first, and therefore an early happening in the clinical course, it discloses a late and inoperable stage of the disease as far as treatment is concerned. Specimens of the fluid obtained by aspiration characteristically are bloody and contain tumor cells. Small pleural effusions that persist after an episode that

1. Boyd, W.: Some Reasons for the Recent Increase of Bronchial Carcinoma, Tr. & Stud., Coll. Physicians, Philadelphia 6:317-328 (Feb.) 1939.

has been considered pneumonia should be viewed with suspicion until they absorb.

Paralysis of the recurrent laryngeal or the phrenic nerves, obstruction to swallowing, cardiac arrythmia, pericardial effusion and obstruction in the superior vena cava are late manifestations of mediastinal extension of the disease. They usually contraindicate operation.

RESPONSIBILITY FOR EARLY DIAGNOSIS

While the burden of responsibility for the early diagnosis of cancer is commonly pictured as resting on the general practitioner, this is by no means always the case. Many patients today have no regular medical adviser and oftentimes place themselves directly in the hands of specialists in one field or another. The patient's own emphasis on secondary manifestations of the disease may cause him to be directed to specialists who are in a position to lose precious time if the false scent is followed. Cough from any cause may focus the attention of the patient on an inguinal hernia he has tolerated for years, or aggravate a prolapsus uteri, the symptoms from which have long been accepted with resignation. There is a danger that surgical treatment, sound in itself but irrelevant to the real issue, may be undertaken. The wheeze may lead the patient to the specialist in allergy, or hemoptysis send him to the tuberculosis specialist who has been known to undertake a long and laborious search to exclude phthisis by bacteriologic analysis or prescribe a trial period of bed rest. A patient with pulmonary osteoarthropathy based on primary cancer of the lung has been known to follow the devious trail from the expert on arthritis via the exodontist to the specialist in physical medicine. Even the neurosurgeon may come into the picture and confuse a cerebral metastasis with a primary brain tumor.

All physicians, whatever their field of concentration or specialization, must be alert to the early signs of internal cancer if material progress is to be made in the control of the disease. This is particularly true of primary carcinoma of the lung with its varied manifestations.

RESPONSIBILITY OF THE ROENTGENOLOGIST

It would be a rare occurrence to arrive at a diagnosis of primary cancer of the lung in the absence of abnormalities discernible by roentgen examination. Precision in the interpretation of these abnormalities thus runs a close second in importance to an alertness on the part of the physician in recognizing early symptoms. A diagnostic roentgen examination in the presence of signs and symptoms does not mean simply taking a roentgenogram. A comprehensive roentgenographic examination includes lateral films and fluoroscopy in addition to the usual anteroposterior exposures. Oblique exposures, spot films, grid films and tomography may be required. Only after comprehensive study and after giving full weight to the clinical manifestations in conference with the referring physician, should one measure a course of delay against the pursuit of further diagnostic investigation.

It is beyond my competence to discuss the details of roentgen diagnosis of pulmonary cancer. While a surgeon or internist may develop considerable skill in visualizing the pathologic lesions displayed on roentgenograms, a precise diagnostic examination is a matter that had best be left in the hands of the highly skilled specialist in roentgenology. However, in order to maintain his position vis-á-vis the surgeon, the roentgenologist must continually check his interpretations with the actual pathologic changes disclosed at the operating table.

RESPONSIBILITY OF THE EXPERT CONSULTANT

Assuming that the clinical manifestations and roentgen examination point toward the possibility of primary cancer of the lung, it is usually desirable at this point to place the problem before an expert consultant. By an expert consultant is meant some physician or surgeon experienced and familiar with the therapeutic management of the disease as well as with diagnosis. This statement may be challenged by those who would extend the responsibilty of the general medical adviser to piecing together fragmentary bits of technical data derived from several different sources. The reason for the statement is that further diagnostic measures, almost without exception, provide information that bears directly on therapy. If these measures are pursued solely to establish a diagnosis, their contribution to the ultimate problem of therapy is likely to be missed and lead to unnecessary repetition. There is no better example of this than bronchoscopic examination.

Bronchoscopy.—The purpose of bronchoscopy in cancer of the lung extends beyond the removal of a fragment of tissue to confirm the histologic diagnosis. The bronchoscopist notes: integrity or paralysis of the vocal cords; the exact position of the growth with reference to the level at which the bronchus must be sectioned if surgical ablation is undertaken; any widening of the angle of the carina formed by the two primary bronchi that may suggest involvement of the subcarinal lymph node; fixation of the region of the growth, and the gross characteristics of any presenting tumor or ulceration. An expert appraisal of these and other bronchoscopic findings is essential to the final decision regarding treatment. Unless the examination is carried out by an operator who is accustomed to make his observations in terms of the feasibility of a surgical attack on the lesion, the bronchoscopy may have to be repeated by one who is.

Bronchoscopy can be expected to yield a biopsy that provides microscopic confirmation of the diagnosis in 60 to 70 per cent of cases. In other words, 30 to 40 per cent of primary cancers of the lung are so situated that they cannot be reached by the biopsy forceps. These proportions are based on series of cases heavily weighted with advanced and inoperable cases, and so are not applicable to the disease in early and surgically favorable stages. Negative findings on bronchoscopy may be of no significance if it is recognized by preliminary roentgen localization that the lesion is inaccessible; for example, in certain segments of the upper lobe. On the other hand, negative findings may be extremely important if the area under question is readily accessible. Improvements in the optical system of bronchoscopic instruments have made visualization of the segmental bronchi of the upper lobes feasible.

Cytologic Methods.—Increased precision in the diagnosis of the disease is provided by methods for recognizing malignant cells in the sputum. In 1935 Dudgeon and Wrigley [2] showed that this method was reliable, and many subsequent observers have confirmed the practical usefulness of the technic.

The method has been modified and its effectiveness increased by examining a specimen of secretion secured directly from the region of the lesion at the time of bronchoscopy. This requires accurate localization of the suspected lesion to a bronchial segment by preliminary roentgen examination and insertion of an aspirating tube into the lumen of the corresponding bronchus. Cells obtained in this manner appear in greater num-

2. Dudgeon, L. S., and Wrigley, C. H.: On the Demonstration of Particles of Malignant Growth in the Sputum by Means of the Wet Film Method, J. Laryng. & Otol. 50:752-763 (Oct.) 1935.

bers and show less degenerative change than those expectorated in the sputum. Herbut and Clerf [3] examined bronchial secretions obtained by this procedure by the Papanicolaou technic in 30 consecutive cases of primary pulmonary carcinoma. Cancer cells were demonstrated in 22 cases, but biopsy specimens of tissue showed cancer in only 11 cases. Bronchoscopy failed to disclose cancer in 7 cases in which cancer cells were present in the aspirated secretions.

Negative results of cytologic studies are of questionable significance, and positive results are valid only when the interpretation is made by an experienced observer. A positive finding by the cytologic method is not as yet given the weight accorded a direct tissue biopsy. It is one additional link in the chain of evidence that requires clinical or roentgenographic support.

Bronchography.—Instillation of iodized oil is rarely a useful aid to the diagnosis or localization of pulmonary cancer and should be used only to answer some highly technical question. The ill advised use of iodized oil as a general diagnostic measure or simply to demonstrate bronchial obstruction may obscure or complicate subsequent roentgenographic studies. There is little to be learned from instillation of iodized oil that cannot be observed with spot films, grid films or tomography. This is true, not only for pulmonary cancer, but in other diseases of the chest as well, the notable exception being bronchiectasis. Even here the chief value of the bronchogram lies in the planning of a surgical program, not merely in arriving at a diagnosis that usually can be established by other means.

Differentiation of Primary and Metastatic Neoplasms.—Because the lung is so commonly a site for the development of metastases from primary growths in other organs, this diagnostic question is one that is raised repeatedly. When a primary or recurrent autonomous cancer is actually present elsewhere, the likelihood that the pulmonary lesion is a secondary deposit is, of course, great. Multiplicity of pulmonary lesions is also strong evidence of metastatic disease. Merely the history of the surgical ablation of a malignant growth in the past, if a reasonable period of time has elapsed without evidence of recurrence of the disease and the lesion in the lung is a solitary one, should not close the door to a consideration of surgical therapy.

The roentgenologist is likely to raise the question of a metastatic origin when the abnormal shadow lies in the periphery of the lung and is spherical. When such a lesion is encountered, and it will commonly be found in a patient with few, if any, clinical manifestations, a painstaking physical examination must be carried out not only to detect a primary source but to be certain that other nodules do not exist from which a biopsy can be obtained more readily than from the one in the lung. In view of the frequency with which renal cell carcinoma casts a solitary metastasis to the lung, pyelography should be carried out. The ultimate decision as to whether the pulmonary lesion should be approached surgically is based on a careful weighing of many variables that never take the same pattern in two different cases. Alexander [4] has assembled the experience of several surgeons with the removal of metastatic neoplasms in the lung.

A rare form of metastatic disease results from a metastasis to the wall of a bronchus. This occurrence closely simulates primary neoplasm of the lung as it may produce bronchial obstruction, hemoptysis, malignant cells in the sputum and positive bronchoscopic findings. No one of these is commonly present with peripheral pulmonary metastases, although hemoptysis is not as rare as it was formerly thought to be.

Differentiation of Primary Cancer of the Lung and Tuberculosis.—A round and apparently "stabilized" focus of the adult type of postprimary tuberculosis may closely resemble an early peripheral neoplasm. So also may the rare postprimary nodule of hemic origin that is characterized by dense fibrosis and in many instances by a retarded tendency toward roentgenographically demonstrable calcification. An intensive search for tubercle bacilli may provide an answer in the first mentioned form of the disease, but will not produce positive evidence in the latter.

Depending on the collateral lines of evidence, surgical exploration of the lesion may be required. The operator should not commit himself to total pneumonectomy, however, until further evidence is obtained at operation. Taking of a biopsy specimen of the dense fibrotic nodule of hemic origin may be accomplished by resection en bloc for immediate pathologic diagnosis. Taking of a biopsy specimen of a circumscribed nodule of adult type postprimary tuberculosis should take the form of a lobectomy, because these lesions are filled with caseous material heavily loaded with tubercle bacilli. When carried out with technical finesse, such a "biopsy" oftentimes proves to have been a remarkably effective method of treating the tuberculosis before frank cavitation is established.

Summary.—This review of the responsibilities of the expert consultant makes it obvious that he should have at his command a number of diagnostic technics that range from careful case history taking and physical examination to thoracotomy for biopsy of a doubtful lesion. These responsibilities must be faced in logical sequence and carried through without delay. On the other hand, the consultant may indulge in certain assumptions relative to his responsibility that are not altogether warranted. Attention is called to these because they may retard the development of that close relationship between practitioner and specialist that is desired to promote progress in cancer control. They also directly influence the extent to which the patient will respond to the educational efforts that urge him to consult a physician in regard to early symptoms.

One of these assumptions is that the expert must invariably exclude any possibility of cancer, however remote, by resorting to major diagnostic technics without regard to whether the clinical problem under consideration indicates their use. Another false assumption is that a presumptive clinical diagnosis always must be extended to histologic confirmation despite the fact that the course of management is obviously not going to be altered by the reading of the microscopic slide. Finally, in deciding on the course that the management of an advanced case is to take, surgical exploration is oftentimes proposed as the "only chance" and as such, one that cannot be denied the patient. In their quest for scientific exactitude the members of the profession must not confuse the scientific precision with which certain parts of the evidence can be formulated with the broad responsibility of weighing evidence as a whole. Courts of law may exact severe or even capital punishment if the evidence as a whole is judged valid "beyond any reasonable doubt." It is the responsibility of the consultant in conference with the family medical adviser to

3. Herbut, P. A., and Clerf, L. H.: Bronchiogenic Carcinoma, J. A. M. A. 130:1006-1012 (April 12) 1946.
4. Alexander, J., and Haight, C.: Pulmonary Resection for Solitary Metastatic Sarcomas and Carcinomas, Surg., Gynec. & Obst. 85:129-146 (Aug.) 1947.

determine whether the "only chance" offered by surgical treatment is in truth a reasonable chance, or whether the cancer is surgically "out of bounds" beyond any reasonable doubt.

ALTERNATIVE FORMS OF TREATMENT

There is no possibility of obtaining a lasting arrest of the disease unless the entire growth can be extirpated. Roentgen therapy appears to halt the progress of a few cancers of the lung temporarily. Occasionally actual regression takes place for a period of several months. Applied indiscriminately to advanced cases, roentgen therapy contributes little either to survival time or relief of physical suffering. The nitrogen mustard compounds produce transient and incomplete regression in about one half the patients treated.[5] Castration and the use of estrogenically active substances have been explored on the basis of the unequal sex incidence of the disease, but no indication of effectiveness has appeared. The crucial decision therefore lies in the judgment regarding the applicability of surgical procedures.

INDICATIONS THAT THE CANCER CANNOT BE EXTIRPATED

Extension to Pleura.—A pleural effusion, usually bloody and containing cancer cells, can be interpreted as definite evidence that the cancer has extended beyond the bounds of surgical extirpation. While patients with this form of the disease suffer from shortness of breath, progressive anemia and cachexia, they usually are not subject to severe pain or distressing cough. Aspiration of the fluid and replacement with air afford partial symptomatic relief.

If the diagnosis is in doubt because cancer cells cannot be demonstrated, the replacement of the pleural effusion with air may bring pleural nodules into view on roentgen examination. A biopsy can be obtained with the aid of the thoracoscope or by a limited thoracotomy with the patient under local anesthesia. A pathologic confirmation of the diagnosis is desirable in this type of the disease, as radiation therapy may be helpful and as a general rule heavy dosage should not be administered without accurate knowledge that the disease being treated is cancer.

Extension to Lymph Nodes.—An exacting palpation of the supraclavicular fossae, neck and axillas should be carried out in every case. The removal of a palpable node with the patient under local anesthesia may confirm a presumptive clinical diagnosis and at the same time demonstrate that the cancer has extended beyond the limits of surgical extirpation. This is a less trying procedure to the patient than bronchoscopy and can be substituted for it not infrequently.

Extension to mediastinal lymph nodes is difficult to establish by roentgen examination alone. Presumptive roentgen evidence may become determinative when combined with bronchoscopic fixation of the growth and pain referred to the back.

Lymphatic Dissemination.—Diffuse spread in the lymphatic channels of one or both lungs with the development of small nodules immediately beneath the visceral pleura may be detected on roentgen examination. Thoracoscopy can be an adequate substitute for a formal thoracotomy.

Hematogenous Metastasis.—Spread to the liver may be suggested by the increased size or palpable nodularity of that organ. Peritoneoscopy is a simple procedure that confirms the diagnosis. Headaches or other cerebral symptoms call for a painstaking neurologic examination, including the determination of the visual fields.

Painful Apical Syndrome.—Pain referred down the arm, a Horner's syndrome, and roentgen evidence of erosion of the first and second ribs are often referred to as Pancoast's syndrome. It is usually produced by a primary cancer of the lung in the superior pulmonary sulcus. A cancer that produces this syndrome is beyond the bounds of surgical extirpation, and the severe pain cannot be relieved by local resection, or division of the intercostal nerves. The pain is oftentimes excruciating and the course of the disease agonizingly slow. Relief should be sought by tractotomy or high chordotomy.

Histologic Type of the Tumor.—The prognosis following surgical extirpation has not been fully correlated with the predominant cytologic characteristics of cancers of the lung. The evidence that exists, however, confirms the reasonable hypothesis that growths with highly undifferentiated cells are rapidly invasive and tend to metastasize early. The same may be said for the so-called oat cell type. Significant results achieved by the surgical extirpation of cancers of these morphologic types are rare. A biopsy that demonstrates a highly undifferentiated or oat cell cancer is presumptive evidence that complete surgical extirpation is a remote possibility.

Nerve Paralysis.—Paralysis of the recurrent laryngeal nerve is evidence of mediastinal invasion at a level that precludes complete surgical ablation. Cancers that have produced phrenic nerve palsy may be resectable grossly. It is significant, however, that Ochsner, DeBakey and Dixon [6] analyzed the survival period in their cases from the standpoint of whether the growth was limited to the lung or had extended beyond it by encroachment on contiguous structures or by regional lymph node metastases and found that only 2 of 27 patients with such extension demonstrated at operation survived beyond a three year period, and none beyond six years.

SURGICAL TREATMENT

Operability.—The experience of many different surgeons in the United States and elsewhere has been surprisingly uniform in the results achieved by surgical extirpation. Apparent differences in the statistical tables that record this experience are usually artifacts developed by the terminology employed, the calendar years covered by the report, the selection of cases and other variable factors.

An analysis of the results of surgical therapy customarily starts with those patients that are referred to a surgeon for consideration of operation. This base line ignores the large number of patients in whom a diagnosis is never made or whose disease is judged so far advanced that surgical consultation is superfluous. It is thus impossible to determine with exactitude the extent to which surgical procedures can be an effective control measure in the population at large. Surgical efforts have rarely been measured against the magnitude of the problem as a whole. Few surgeons, particularly those whose cases are assembled from a private clientele, appear to be aware of the selection that has taken place before their own "series" was assembled.

In 996 cases with the clinical diagnosis of bronchiogenic carcinoma at The Brompton Hospital for Diseases of the Chest, in London,[7] from 1937 to and including 1944, only 15.3 per cent (152 cases) were judged suitable for a thoracotomy. In cases in which thoracotomy was done, extirpation of the growth was performed in

5. Rhoads, C. P.: Recent Advances in Treatment of Cancer, J. A. M. A. 136: 305-308 (Jan. 31) 1948.

6. Ochsner, A.; DeBakey, M., and Dixon, J. L.: Primary Cancer of the Lung, J. A. M. A. 128: 321-327 (Oct. 11) 1947 (revision by personal communication to the author, March 1948).

7. Björk, V. O.: Bronchiogenic Carcinoma, Lund, Berlingska Boktryckeriet, 1947; Acta Chir. Scandinav. (suppl. 123) 96: 1-113, 1947.

75 cases, or 7.5 per cent of the whole. Despite this gloomy picture, which possibly is attributable in part to the war years, the cases considered favorable for thoracotomy increased from 8.2 per cent in 1937 to 25.6 per cent in 1944. Furthermore, resectability increased from 5.1 per cent in 1937 to 13.5 per cent in 1944. These basic figures from the Brompton Hospital are significant because during this period a vigorous surgical program was being pressed by Edwards, Roberts, Price Thomas and Brock. Their importance lies in the base line provided by the population of a large hospital admitting persons with medical and surgical diseases of the chest.

The range of applicability of surgical procedures provided by reports from surgeons in the United States is more favorable, but these reports are heavily weighted by collecting of patients from a wide area because they were judged favorable for operation. They do not accurately represent the state of affairs relative to the disease as a whole. Nine reports (Adams,[8] Burnett,[9] Churchill,[10] Clagett and Brindley,[11] Graham,[12] Jones,[13] Lindskog,[14] Ochsner, DeBakey and Dixon,[6] Overholt[15]) published since 1940, record 1950 cases. In 782 (40 per cent) of these thoracotomy was done, and in 432 cases resection was performed (22 per cent).

It should be recalled that the first total pneumonectomy that launched the surgical attack on pulmonary cancer was performed in 1933 (Graham)[16] and that several of the series of cases referred to date back to that year or shortly thereafter. There is an encouraging trend toward a higher proportion of operable cases in the more recent reports and in current experience.

When an attempt is made to estimate the proportion of patients who die in hospitals as an immediate result of the operation or its attending complications, the changing background provided by technical improvements, chemotherapy, blood transfusion and other adjuvants to surgical management necessitates yearly corrections. In addition, the removal of growths that are not localized to the lung has carried a higher mortality rate than is encountered when dealing with the more favorable localized growths that are coming to the surgeon with increasing frequency. The 1947 report of Jones,[13] based on the experience of the preceding four years, gives a better index of what is going on now than a summation of earlier experience. A total of fifty-two pneumonectomies with but 2 hospital deaths yielded an actual operative mortality of less than 4 per cent. This was accomplished on the basis of performing thoracotomy in 33 per cent of the cases diagnosed and carrying out pneumonectomy in 20 per cent of the total cases. Similarly, in 1946, Adams [8] on the basis of a 31.4 per cent rate of resection recorded a hospital mortality rate of 3.3 per cent in his most recent thirty consecutive resections.

These figures are startling, as they show that the operative mortality rate of total pneumonectomy for pulmonary cancer can now be made equivalent to that of partial gastrectomy for malignant lesions of the stomach (3.2 per cent, Mayo Clinic, 1945), and considerably lower than that of total gastrectomy (16.7 per cent, Mayo Clinic, 1945). The resectability rate for malignant lesions of the stomach, i.e., the ratio of patients who undergo resection to the total patients in whom the diagnosis is made, is somewhat higher (38 per cent).

Survival Expectancy.—Careful follow-up statistics that measure the survival expectancy in pulmonary malignancy treated by surgical resection have not as yet leveled off to even an approximation of accuracy. It is probably more informative to consider that Graham's patient, in whom a total pneumonectomy was performed for squamous cell carcinoma in 1933, is still alive and well than it is to attempt to interpret the preliminary analyses that have been placed on record.

There are several variables to be considered, not the least of which is whether the growth appeared to be localized to the lung at the time of resection or whether it gave evidence of having extended to the mediastinum, either by regional metastases or encroachment on contiguous structures. Ochsner, DeBakey and Dixon [6] performed resection in 43 cases in which the growth was considered to have extended beyond the lung and for which sufficient time had elapsed so that the three year survival rate could be computed. Five of these 43 patients were surviving at the end of three years. Of 18 patients for whom a five year survival rate could be computed, only 1 was alive. Not a single instance of survival as long as one year is recorded for 244 untreated patients.[17] It seems reasonable to suppose, therefore, that removal of the lung bearing the primary growth rids the patient of certain complications of the disease that accelerate his death. The relentless progress of the disseminated cancer continues.

This concept that the local primary growth not only causes distressing symptoms, as in cancer of the rectum, but accelerates death, as in obstructing cancer of the pylorus or esophagus, is well known to surgeons but needs far greater emphasis elsewhere in the profession. Surgical treatment of cancer is too often harshly judged as being futile on the grounds that it fails to produce a lasting cure, rather than on the fact that it makes the best terms possible with a disease that is already hopeless.

Another variable in the reports of survival centers in the pathologic classification of the peculiar tumor known as bronchial adenoma. Arguments as to whether this neoplasm is malignant have obscured certain clinical facts about which there can be no difference of opinion. Clinically, the bronchial adenoma pursues a leisurely and protracted course, and when resected, recurrence or subsequent dissemination is practically unknown. The tumor is rare in comparison with the forms of pulmonary carcinoma under discussion ; yet the inclusion of a few cases when the survival expectancy following operation is being tabulated will afford an unduly optimistic interpretation of results.

Adjuvant Surgical Measures.—Extension to the parietal chest wall is likely to occur with peripheral squamous cell cancers. The pain caused by this extension in inoperable cases may be alleviated by section of the intercostal nerves or may require chordotomy. Drainage of an abscess or empyema may reduce a productive cough or minimize the burden of infection. The effects

8. Adams, R.: Primary Lung Tumors, J. A. M. A. **130**: 547-553 (March 2) 1946.
9. Burnett, W. E., in discussion on Gehauer, P. W.: Differentiation of Bronchiogenic Carcinoma, J. Thoracic Surg. **10**: 373-400 (April) 1941.
10. Churchill, E. D.: Resection of the Lung, Surgery, **8**: 961-991 (Dec.) 1940.
11. Clagett, O. T., and Brindley, G. V., Jr.: Bronchiogenic Carcinoma, S. Clin. North America, **24**: 839-850 (Aug.) 1944.
12. Graham, E. A., in discussion on Lindskog.[14]
13. Jones, J. C.: Surgical Aspects of Bronchiogenic Carcinoma, J. A. M. A. **134**: 113-117 (May 10) 1947.
14. Lindskog, G. E.: Bronchiogenic Carcinoma, Ann. Surg. **124**: 667-674 (Oct.) 1946.
15. Overholt, R. H.: A Common Masquerading Lung Disease, Dis. of Chest **9**: 197-211 (May-June) 1943.
16. Graham, E. A., and Singer, J. J.: Successful Removal of an Entire Lung for Carcinoma of the Bronchus, J. A. M. A. **101**: 1371 (Oct. 28) 1933.
17. (a) Widmann, B. P.: Roentgen Therapy for Bronchiogenic Cancer, Am. J. Roentgenol. **51**: 61-69 (Jan.) 1944. (b) Laddy, E. T., and Moersch, H. J.: Roentgen Therapy for Bronchiogenic Carcinoma, J. A. M. A. **115**: 2239-2242 (Dec. 28) 1940.

of chemotherapy are transient and incomplete when the pneumonitis or abscess is peripheral to a blocked bronchus.

The Operation.—The operation of total pneumonectomy is so standardized that it warrants little comment. The lung is mobilized, if adherent, and the vessels secured by individual ligatures. The bronchus is divided and closed by interrupted sutures. Some operators place emphasis on the use of stainless steel wire sutures, but the important technical precaution appears to lie in the avoidance of necrotizing clamps and sutures. The closed bronchial stump is covered by a flap of pleura, a mobilized intercostal muscle and pleura or a free graft of lung tissue.

The chest is closed without drainage, leaving the dead space to be obliterated partly by organizing exudate and partly by displacement of the mediastinum, rise of the diaphragm and retraction of the chest wall. Some surgeons find that thoracoplasty is advisable in many cases after a certain amount of time has elapsed. Others rarely find it necessary to carry out this procedure. Certainly it should be done for good reason, if at all.

The age group of patients concerned brings a substantial incidence of cardiovascular complications. Cardiac arrhythmia, particularly auricular flutter, may occur in the postoperative period. For this reason preoperative preparation with quinidine is recommended.

Blood lost at the operation should be replaced in volume, but, because of the dangers of edema in the remaining lung, additional fluids are administered in moderation. Oxygen therapy is usually employed during the first twenty-four hours. The total hospital stay after the operation has been greatly reduced and now rarely exceeds two weeks. Early ambulation is beneficial and there is no danger of incisional dehiscence or hernia.

A well administered anesthetic is vital to the patient and the technical steps of the operation. A few anesthetists continue to magnify the technics and complicate the procedure with cumbersome appliances, but as a general rule anesthesia for major intrathoracic procedures has settled down to standardized intratracheal technics that require little comment. The important qualities demanded of the anesthetic agent are, first, that it have as wide a margin of safety as possible and, second, that full anesthesia can be maintained with a high percentage of oxygen in the mixture.

Position on the table, incision, instruments and other details are matters that are best left to the operating surgeon, who is assumed to have sufficient competence to undertake the procedure.

The surgical excision of cancer of other organs began with limited resection and extended to radical resection. In contrast, the surgery of cancer of the lung, except for a few sporadic attempts, started with total pneumonectomy. This in part accounts for the uniformity of results that have been achieved. It is customary for surgeons to take the position that total pneumonectomy is the only acceptable form of operation. If the mortality rate of total pneumonectomy is the same as that of a more limited resection, and the life expectancy rate or disability of persons with one lung equal to that of persons after a lobectomy, the matter can be closed. As long as any disparity in these values exists, however, the question of the place of less radical procedures in carefully selected cases must be kept open.

NONSURGICAL TREATMENT

As long as only 1 or 2 patients out of 5 that come to the surgeon have resectable growths, a patient should be informed before the consultation that his particular problem may or may not be solved by surgical procedures. A patient is likely to come to the surgeon with high hopes that if the growth can be resected his life will be saved but that if the operation cannot be performed he is doomed to die. Even a limited faith in any alternative method of management has been completely destroyed. It is less disturbing to the patient and to an apprehensive family to speak of surgical operation as one of several methods of management that may have to be pursued. It can be explained to the patient that certain forms of his disease can best be managed by surgical procedure and others by radiation therapy, nitrogen mustard, and so on; that sometimes it is necessary actually to look at the diseased area and determine its position and nature by thoracotomy before the decision as to the most effective method of management for his particular case can be made.

When surgical procedures are found impossible, great comfort is derived from the knowledge that some constructive course can be taken, even though the chances of success may be slight. The patient will rarely concern himself about the magnitude of this chance if he is led to feel that everything possible is being done.

There is no short cut that can teach a surgeon what to say and how to say it when he is faced by patients with inoperable malignant disease. He may elect to remain on the purely technical level, a position that certainly is the least troublesome and time consuming. It may be found that this is the only position that can be taken in certain situations. On other occasions, the surgeon may be the only person in a position to guide the patient and his immediate family through a trying period. This takes time. While the exploratory thoracotomy that reveals an inoperable growth may be completed in three quarters of an hour, several hours must be spent with the family, the patient and in conference with the physician who is to take over the daily management of the case after discharge from the hospital.

Surgeons today, struggling to keep abreast of a heavy load of technologic detail, unfortunately find little time for these matters. If they are to maintain their position as doctors in contrast to artisans, the responsibilities entailed must be faced.

Clinical Notes, Suggestions and New Instruments

FLUID REPLACEMENT WITH HALF STRENGTH SODIUM CHLORIDE SOLUTION

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Loss of fluid in intestinal obstruction results from two developments following onset of the condition. First, frank loss of secretions occurs as a result of (*a*) vomiting, (*b*) stagnation of secretions above the level of obstruction and (*c*) suction or siphonage instituted when the patient is placed under management. Second, loss of income is sustained as a result of abstention from food and beverages.

The amount of loss in the first of these developments varies with the volumes vomited, stagnant in the intestinal lumen and aspirated by suction or siphonage. Whatever this volume may be, it is composed of water with organic and inorganic substances the most important of which is sodium chloride. The concentration of the salts in the gastrointestinal secretions is ap-

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proximately that of the same salts in the blood serum.[1] To compensate for this loss it has been suggested that 0.9 per cent sodium chloride solution be administered with a volume replacement equal to the volume lost.

The loss of fluid due to lack of income amounts to 2 to 3 liters daily. This amount affords 1 to 1½ liters of water for the adequate removal of waste materials in the urine (specific gravity 1.015 to 1.025) and 1 to 1½ liters for regulation of body temperature through cutaneous evaporation, perspiration and pulmonary ventilation. In any loss of fluids output of urine diminishes immediately, while regulation of body temperature remains active. This is made possible by use of the water reserves in the body. When the latter fails, hyperthermia and other evidences of hypohydration become manifest. Since under normal conditions this 2 to 3 liters is essentially water with a sodium chloride content of approximately 5 Gm., a parenteral replacement for this loss would be 2 to 3 liters of water (5 per cent dextrose in distilled water) with an addition of about 5 Gm. of sodium chloride (500 cc. of 0.9 per cent sodium chloride).

Thus, in intestinal obstruction part of the fluid required for replacement of loss is equivalent to 0.9 per cent sodium chloride solution, while the balance of the loss is water without sodium chloride. A solution containing 0.45 per cent sodium chloride and 2.5 per cent dextrose (an isotonic solution) would seem to be an appropriate solution for fluid replacement. This solution does not supply too much sodium chloride, nor does it fail to supply enough. Five liters of this solution for hydration would supply 22.5 Gm. of sodium chloride. This would be adequate for most patients with intestinal obstruction who have lost 2 to 3 liters of intestinal secretions, while awaiting relief from any method of planned conservative therapy or surgical therapy. If parenteral therapy is continued for several days the half strength solution would adequately supply the mineral needs while secretions are not being absorbed.

It must be understood that administration of fluid is not a substitute for surgical treatment in intestinal obstruction. Administration of fluid, however, does hydrate the patient, makes possible urinary excretion and regulates body temperature. The minerals in the fluids administered supply the electrolytes lost in the intestinal secretion and restore the blood levels of these elements to the normal. A judicious selection of isotonic solutions with and without sodium chloride would, of course, supply enough and not too much sodium chloride. However, the half strength sodium chloride solution is an assurance that no excess of salt would be administered.

Manufacturers of parenteral fluids have not included the 0.45 per cent sodium chloride in 2.5 per cent dextrose solution in their line. This solution has been used with satisfactory results for many years on many services at Cook County Hospital. Dr. Bernard Fantus advocated its use and pointed out the dangers of the continuous use of normal sodium chloride solution.[2] It would be a progressive measure if this solution were more readily available in all hospitals. It would permit the patient to be freed from the dangers of the excessive administration of sodium chloride, in a condition in which sodium chloride is of utmost importance. In addition, for the conditions in which little loss of sodium chloride occurs and water replacement is necessary this half strength solution presents a safety factor in that it does not supply too much salt.

1. Gamble, J. L.: Express Cellular Fluids, Cambridge, Mass., Howard University Press, 1942.
2. Fantus, B.: The Technic of Medication: Intravenous Osmotherapy, J.A.M.A. 87:411-413 (Aug. 7) 1926; Chicago, American Medical Association, 1938, chap. 8, pp. 490-495.

Council on Pharmacy and Chemistry

The Council has authorized publication of the following reports.

AUSTIN SMITH, M.D., *Secretary.*

RECOGNITION OF ADDITIONAL GENERIC NAMES FOR COUNCIL-ACCEPTED PRODUCTS

In pursuance of its policy requesting the use of generic or unprotected names for products accepted for inclusion in New and Nonofficial Remedies under protected names, the Council asks the interested firms for suggestions, which are considered by the Council's Committee on Nomenclature and from which are chosen terms eligible for recognition. Recently the Council voted to recognize the following generic terms:

BISMUTH ARSPHENAMINE SULFONATE for Bismarsen-Abbott Laboratories.

ACETYPYROGALL for Lenigallol-Bilhuber-Knoll Corporation.

DIALLYLBARBITURIC ACID for Dial-Ciba Pharmaceutical Products, Inc.

IODINATED CASTOR OIL for Riodine-Gallia Laboratories.

PHENYLPROPYLMETHYLAMINE for Vonedrine-the Wm. S. Merrell Company.

BETETHAMINE for Monocaine-Novocol Chemical Mfg. Co., Inc.

SODIUM BISMUTH THIOGLYCOLLATE for Thio-Bismol-Parke, Davis & Company.

METHENAMINE TETRAIODIDE for Siomine-Pitman Moore Company.

ALLYL BARBITURIC ACID for Sandoptal-Sandoz Chemical Works.

PSYLLIUM HYDROPHYLIC MUCCILLOID for Metamucil-G. D. Searle & Company.

Additional generic names will be published as soon as the Council has considered them.

GENERIC TERM FOR DIOCYL HYDROCHLORIDE: DICYCLOMINE HYDROCHLORIDE

The Wm. S. Merrell Company requested the Council's recognition of the proprietary name Diocyl Hydrochloride and the generic designation Dicyclomine Hydrochloride for *β*-diethylaminoethyl-1-cyclohexylcyclohexane-carboxylate.

On the basis of the information submitted by the firm, the Council voted to recognize the stated names as protected and generic terms, respectively, for this compound.

ALCOHOL-DEXTROSE and DEXTROSE-VITAMIN SOLUTIONS FOR INTRAVENOUS INFUSION NOT ACCEPTABLE FOR N.N.R.

Solutions for intravenous infusion of fluids, dextrose, salts or ions have been long established as a recognized form of replacement therapy in patients having a temporary deficiency of such essentials because of surgery or emergency illness. In the treatment of shock, the injection of crystalloids has been largely superseded by plasma or serum. For intravenous feeding, solutions of protein hydrolysate with dextrose are supplementing the use of dextrose alone as a source of caloric energy to sustain the nutritive requirements of such patients.

Recently the Council was requested to give consideration to a preparation of ethyl alchol 5 per cent and dextrose 5 per cent in isotonic sodium chloride solution for intravenous infusion postoperatively to provide the combined sedative-analgesic effect of alcohol with the caloric value of alcohol and dextrose in a single preparation. The Council was subsequently requested to consider a similar alcohol-dextrose combination, available in concentrations of either 5 or 10 per cent alcohol with 5 per cent dextrose in either distilled water or isotonic sodium chloride solution and with or without the addition of the vitamins, niacinamide, riboflavin and thiamine hydrochloride. The Council also gave consideration to a dextrose-vitamin mixture available in concentrations of 5 and 10 per cent dextrose with the same three vitamins in either distilled water or isotonic sodium chloride solution. The evidence advanced in support of these preparations included

reports from the medical literature on the use of alcohol for intravenous infusion as a postoperative sedative or analgesic and as an adjunct in the treatment of certain diseases, including delirium tremens. Other reports concerning the need for certain vitamins essential to the metabolism of carbohydrate and as an adjunct in the treatment of alcoholism were also submitted.

In reviewing the evidence for the submitted mixtures the Council found the reports poorly documented and the evidence unconvincing. With regard to the intravenous use of alcohol-dextrose preparations, it was pointed out that while alcohol so administered is not necessarily potentially dangerous, its peripheral vasodilatory effect could be deleterious in the presence of shock or impending surgical shock. It was considered that, although such a solution might conceivably be found useful when other narcotics were contraindicated, alcohol is also subject to the production of tolerance, leaves much to be desired as a sedative and is only a feeble stimulant of respiration. There are other methods of combating postoperative pain and restlessness that do not require the injection of large volumes of expensive solution. Concerning the caloric value of alcohol as a supplement to dextrose it was pointed out that while 1 cc. of absolute alcohol yields approximately 8 calories, the high specific dynamic action of alcohol would negate a fair amount of what is gained by its administration; furthermore, additional dextrose could accomplish the same purpose.

Claims for the intravenous use of alcohol in the treatment of pneumonia, pulmonary abscess or gangrene were held to be misleading. It was further indicated that the use of alcohol in the treatment of delirium tremens had been abandoned by many clinics because it constitutes no cure and does not relieve the disturbances associated with this disease any better than conventional methods of therapy.

The addition of vitamins to either alcohol and/or dextrose solutions for intravenous injection was held to represent a form of shotgun vitamin therapy that is overelaborate. It was agreed that although carbohydrate requires thiamine and riboflavin for its complete metabolism and such components of the vitamin B complex may have some use in overcoming deficiencies in alcoholic persons, it is not established that a single dose of either alcohol or dextrose, or both, requires the simultaneous administration of vitamins in the same solution. It was pointed out that patients receiving parenteral solutions of this type do so for the relatively short period of postoperative recovery, so that any acute deficiency of vitamins is not significant. It was emphasized that employment of such therapy presupposes that necessary amounts of the vitamins needed are not available within the body, a state of deficiency which is not established or likely in the conditions for which the solutions are proposed. It was further indicated that in prolonged undernutrition vitamins in larger amounts than are provided by ready-made solutions may be required, which need, can therefore be met by more rationally separate administration of the vitamins or their addition to a simple infusion solution in dosage requisite to meet the demands of such patients. The marketing of ready-made solutions containing vitamins was held to add materially to the cost for the patient and to serve no useful purpose.

The Council concluded that alcohol-dextrose and dextrose-vitamin solutions for intravenous infusion are not acceptable for inclusion in New and Nonofficial Remedies because they are unnecessarily elaborate and the claims for their use are not supported by convincing evidence of the need for or value of infusion of this type.

The drug will continue to be available only in capsule form for oral administration. Since it is important to hold narcotic administration to a minimum, to facilitate this and to permit adjustment of dose to the need of a particular case each capsule will contain 3 mg. of metopon hydrochloride. The minimal effective analgesic dose in nontolerant persons is 6 mg. Therefore, the dose is two capsules for persons who have not taken morphine and related substances previously, and it may be three or more capsules for persons already tolerant to morphine and the like. Institution of treatment with metopon hydrochloride in the latter group should be accompanied by rapid reduction rather than abrupt discontinuance of the previous medication.

The Committee on Drug Addiction and Narcotics of the National Research Council through its secretary (Nathan B. Eddy, National Institute of Health, Bethesda 14, Md.) will be glad to continue its correspondence with physicians in regard to their experience with metopon hydrochloride and to advise them on the use of the drug.

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

SULFADIAZINE (See New and Nonofficial Remedies, 1947, p. 120).

The following dosage form has been accepted:
McNEIL LABORATORIES, INC., PHILADELPHIA.

Liquoid Sulfadiazine: 120 cc. and 480 cc. bottles.

DIETHYLSTILBESTROL (See New and Nonofficial Remedies, 1947, p. 347).

The following dosage form has been accepted:
ESTRO CHEMICAL CO., INC., NEW YORK.

Solution Diethylstilbestrol in Oil: 1 mg., 2 mg., and 5 mg. per cc.; 1 cc. ampuls and 30 cc. vials in corn oil. Preserved with chlorobutanol 0.5 per cent.

NIKETHAMIDE (See New and Nonofficial Remedies, 1947, p. 260).

The following dosage form has been accepted:
PREMO PHARMACEUTICAL LABORATORIES, NEW YORK.

Solution Nikethamide 25% W/V: For oral use 15 cc., 45 cc. and 480 cc. bottles. For parenteral use 1.5 cc. and 5 cc. ampuls.

ESTRONE (See New and Nonofficial Remedies, 1947, p. 341).

The following additional dosage forms have been accepted:
PARKE, DAVIS & CO., DETROIT.

Solution Theelin in Oil: 1 mg. (10,000 international units) in 10 cc. vials in peanut oil. Preserved with benzethonium octyloxyacetate 1:4,000.

Aqueous Suspension Theelin: 1 mg. (10,000 international units) and 5 mg. (50,000 international units) in 1 cc. ampuls. Preserved with benzethonium octyloxyacetate 1:4,000.

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SATURDAY, MAY 29, 1948

EDITORIAL ANNOUNCEMENT

The absence of the compositors from their work continues. This issue of THE JOURNAL has been prepared in part by the use of Vari-Typer machines.

MEDICAL RESEARCH

Volume five of the Steelman Report on "Science and Public Policy" concerns itself largely with the manner in which the federal government can most effectively promote and encourage scientific research on medical problems. The nation invests some $110,000,000 annually for scientific research and development in medical and allied fields as contrasted with ten times that amount for all other forms of scientific inquiry. The Committee on Medical Research of the Office of Scientific Research and Development devoted its attention to the solution of practical problems. Establishment of a committee composed of government and nongovernment medical scientists has been recommended to suggest a comprehensive program to utilize most effectively all the nation's resources. Recommendations are that funds be distributed for basic and applied research and for training of investigators. Expenditures for medical and allied research, according to the Steelman report,[1] should be at least tripled by 1957 to not less than $300,000,000 yearly.

Of funds from all sources devoted to medical research in 1947, industry contributed 45 per cent, federal, state and local governments 28 per cent and foundations 13 per cent. Comment was made that the private foundations such as the Rockefeller Foundation, Commonwealth Fund, the Kellogg Foundation and the Milbank Memorial Fund, which have contributed so greatly to medical research in the past, seem to be contributing less to the postwar requirements. According to the report, dissipation of their capital resources probably will continue and may mean their eventual dissolution. Universities and medical schools which provide the country with physicians and investigators have felt the pressure of declining endowment funds and are looking for new sources of support not only for research but for general administrative purposes. A recent survey of twenty-eight university medical schools, it was stated, showed one-fourth of them to have no money for research from any source. One obvious conclusion drawn from this was that the federal government should give support to these institutions not in the form of specific grants for specific purposes but in the form of general funds to be used by the medical schools as decided by their administrations.

The serious problem of shortage of personnel and facilities in an expanding program was analyzed, and effects of the unwise policy of neglecting the training of scientific personnel during the war was noted. In 1940 there were graduated as Ph.D's 21 in anatomy, 59 in bacteriology, 130 in biochemistry, 70 in physiology and 112 in zoology. In 1945 graduates in these fields decreased to 4, 27, 83, 25 and 27, respectively. Competition for medical investigators from industry and government is a serious and continuous threat, constituting a sort of interuniversity cannibalism. The crisis in the medical schools is attributed by the report to the mounting cost of operation and lack of an adequate program to cope with these problems. Schools are required to increase the teaching load, to increase student fees and to diminish space for research.

The report deals with the organization and administration of government-supported medical research, pointing out the necessity for preventing duplication of effort among the several agencies of the government that support research. In order to avoid such duplication it was recommended that a subcommittee of the Interdepartmental Committee on Scientific Research and Development be established for medical research, composed of representatives of federal agencies and research scientists from outside government. These representatives should be chosen from among professional research workers who are informed on research and its problems and on the requirements of fundamental research, applied research and development. This should apply equally to clinical research, psychologic and sociologic investigation and laboratory work.

Attention is called to the several advantages offered by the government to research workers who are federal employees, i.e., job security, vacations and sick leave with pay,

1. Gustavus Barron, E. S.: The Nation's Medical Research, Bull. Atomic Scientists 4:59-60 (Feb.) 1948.

increases in pay and well established retirement benefits.

Medical research projects supported in outside institutions by federal agencies are devoted to problems defined by the supporting agencies or chosen by individual investigators and supported by the National Institute of Health or the Office of Naval Research. In the latter cases, outside experts analyze the projects and advise approval or rejection.

The close correlation between the institutions represented on the study sections of the National Institute of Health and the location of approved projects was noted. More than one fourth of the five hundred and forty medical research projects supported by federal agencies in outside institutions during the fiscal year of 1947 were located in seven medical schools in the northern and eastern parts of the country. "Unless a conscientious effort is made to spread some of the available project money among little known institutions, there is little likelihood of expanding the number of medical research centers and capitalizing fully on the potential of research manpower."

The major question in the problem of improving medical research throughout the country is that of fellowships, postdoctorate and predoctorate. A number of organizations give the former type, but only the National Institute of Health subsidizes graduate students interested in becoming research scientists. In a plan to deal with the nationwide shortage of medical scientists the report lists these recommendations: *(a)* triple the number of fellowships in medical and allied sciences; *(b)* increase the fellowships' stipend; *(c)* give special emphasis to areas of shortage, *(d)* put the task of selecting and alloting funds for fellowships in the hands of persons responsive to both executive and legislative controls; *(e)* give careful consideration to the need for undergraduate scholarships in the basic sciences related to medicine; *(f)* make the whole program of the federal government flexible enough to allow shifts in emphasis between research fellowships and project research as needed, and *(g)* give encouragement to fellows to return to their original institutions with the hope of developing subsidiary research and training centers.

In most respects the report is well conceived and the recommendations, if carried out, would help to expand and improve medical research in the United States. However, much additional stress should be placed on medical research from the personal point of view. The concept of the starving scientist so devoted to his work and to the benefit of humanity that he can afford completely to neglect monetary considerations has become a part of the accepted pattern in this field; sufficient consideration has not been given to it as one of the major problems of obtaining research personnel. Many brilliant and promising young scientists have through force of economic circumstances and disgust with the paltry income associated with research given up research to enter more lucrative fields. The maximum fellowship stipend now offered by the National Institute of Health is $3,000 per year for a person with dependents. Research and teaching fellowships in universities average less than $4,000 per year. These sums attract few men of the caliber needed to improve and expand medical research in the United States. Medical research in industry and in government services has been chiefly of the applied or developmental type. The first inclination of sponsors has been to support research that would soon prove useful or adaptable clinically. More recently, however, a shift toward research in cancer and some of the more recalcitrant, degenerative diseases represents a triumph of scientific curiosity over utilitarianism. In the basic sciences, anatomy, physiology, embryology, bacteriology and genetics, tall towers of knowledge have been erected. In few instances, however, can we fit our basic knowledge in these spheres to the simple logic of figures or formulas, the measure of a true science.

With the funds hopefully forthcoming, increased numbers of well paid, trained scientists should make rapid strides in the basic sciences. Team methods developed during World War II give much promise and should overcome many of the deficiencies of the individual approach.

SCURVY AND RICKETS ARE STILL WITH US

The clinical application of fundamental principles of nutrition is not abreast of increasing knowledge of nutrition. Infants with rickets or scurvy still appear frequently in the pediatric clinics of many of our teaching institutions. Recently a relatively small pediatric service admitted 3 infants with frank scurvy in as many months. The gratitude of the teaching staffs for such teaching material is exceeded only by the embarrassment of rationalizing the occurrence of such cases to the medical student. From his earliest days in medical school, the modern student has been taught that prophylactic administration of vitamins C and D should reduce scurvy and rickets to obsolescence.

Association of scurvy with poverty, malnutrition and lack of medical care is no longer entirely valid. Many recent cases have arisen in families of moderate economic circumstances and have demonstrated optimal gains in length and weight. Usually patients have been observed

at regular intervals by physicians. Factors other than parental ignorance or economic circumstance must be at fault.

Almost uniformly these infants have been fed on proprietary preparations which are often represented as "complete infant foods." Indeed, the rapid gains in length and weight testify to the completeness of these foods—with the exception of vitamins. Because growth is occurring rapidly during infancy, requirements for vitamins must be fully satisfied; growth will cease if these demands are not met. As these preparations are usually fed under the direction of a physician, he must assume the responsibility of ascertaining specifically the vitamin content of these preparations in relation to the specific needs of the patient, regardless of the claims of the manufacturer concerning the completeness of the food. Reliance on such preparations for appropriate intake of vitamins is unwise since quantities of the product fed from day to day and from patient to patient are highly variable. Oliver Wendell Holmes said, "A pair of substantial mammary glands have the advantage over the two hemispheres of the most learned professor's brain in the art of compounding a nutritive fluid for infants." Perhaps in these days when hypofunction of the postpartum breast is a national phenomenon, refuge in the cerebral hemispheres of the learned physician is necessary. Fortified with adequate knowledge of nutrition, he can eliminate scurvy and rickets from the American scene.

Current Comment

VITAMINS OF THE "B" COMPLEX AND RESISTANCE TO MALARIA

The effect of a vitamin deficiency on resistance to infection appears to be dependent on the relative requirements of the infectious agent and of the host for the particular vitamin. If the invading organism requires larger amounts of the vitamin than the host, deficiency of the vitamin appears to increase the resistance to the infection; if, however, the host requires the larger amount of the vitamin, deficiency decreases the host's resistance. Increased resistance to malarial infection is found in deficiencies of both riboflavin and pantothenic acid in chickens and in lack of ascorbic acid in monkeys. Deficiencies may be produced not only by low levels of the vitamins in the diets but also by the administration of analogous compounds which antagonize the vitamins; one of these compounds, pantoyltauramido-4-chlorobenzene, has been found to be four times as effective as quinine in the treatment of a standard four day trophozoite-induced infection.[1] This analogue of pantothenic acid inhibits only the blood phases of the infection; either the tissue phases apparently do not require pantothenic acid or there is a sufficient small amount in the tissues. Deficiency of other vitamins, such as nicotinic acid and biotin, is accompanied by a definite decrease in resistance to the malarial organism. The cause of the diminished resistance in biotin deficiency has been investigated and found to be due to decreased formation of an active antimalarial factor, lipid in nature and associated with the serum proteins.[2] Injection of plasma protein fractions rich in this factor inhibit the multiplication of the malarial parasite. This substance, which is formed only when the diet contains biotin, will replace biotin on a biotin-deficient diet, although it does not have the chemical properties of biotin. Further studies on the nature and properties of this anti-infective agent will be awaited with interest.

1. Brockett, S., Voletsky, E. V., and Baker, H.: J. Parasitol. 32: 453, 1946.

2. Trager, W.: J. Exper. Med., 85: 663, 1947.

THE PROGRAM OF THE NATIONAL CANCER INSTITUTE

The functions of the federal government in research and control of cancer were outlined in the National Cancer Institute Act of 1937, which created the National Cancer Institute and the National Advisory Cancer Council. In July 1947 the National Cancer Institute was reorganized to provide for effective integration of a much expanded program.[1] The activities of the institute were divided into three major fields: scientific research within the institute, research grants to outside institutions and cancer control. The institute's total appropriation for the fiscal year 1948 is $14,000,000. Some of the technics employed in the study of cancer by the biology section are artificial production of cancer in experimental animals; study of tumors grown within a transparent chamber attached to the living animal, and growth of animal tissue in vitro. This section is also engaged in establishing procedures for the isolation of tumor-inducing viruses. Grants have been awarded for the work of one hundred and ninety-two different investigators in eighty-eight institutions, mostly universities or hospitals with research laboratories. The institute also awards research fellowships to increase the number of trained scientists from whose ranks men and women may be recruited to staff the laboratories in which research on cancer is conducted. There were one hundred and nine research fellows on duty Jan. 1, 1948. The program recognizes that the key figure in cancer control is the physician. Every effort is being made to provide the members of the medical profession with opportunities for training in the diagnosis and treatment of the disease. A grant-in-aid program has been undertaken to enable medical schools to develop better integrated courses in cancer for their students. Grants to forty schools, amounting to approximately $900,000, had been recommended up to Jan. 1, 1948.

1. The Program of the National Cancer Institute, Pub. Health Rep. 63:501 (April 16) 1948.

ORGANIZATION SECTION

NATIONAL CONFERENCE ON RURAL HEALTH

Third Annual Meeting, Palmer House
Feb. 6 and 7, 1948

(Continued from page 777,
THE JOURNAL, MARCH 13, 1948)

Dr. F. S. Crockett, Presiding

Rural Public Health Organization

Panel Discussion

MRS. GLADYS TALBOTT EDWARDS, Director of Education, Farmers Educational and Cooperative Union of America, Denver: The National Health Program of the American Medical Association states that every child should have proper attention, including scientific nutrition, immunization and other services included in infant welfare. No one would disagree with that statement, and many believe that every child should have more than this in health care. They feel that health is a public responsibility just as education is. This must be true for the Negro child in rural areas as well as for the white child in rural areas. It has too long been taken for granted that farmers are healthy because they have plenty of fresh air and sunshine. We have closed our eyes to the fact that poor housing, poor ventilation, poor nutrition, contaminated water and milk supply and a lack of insect and rodent control can almost completely offset the fresh air and sunshine.

At a recent health workshop held in Aberdeen, S. D., about two hundred farm people gathered to discuss their health needs. Under the heading of public health needs were listed five major items: (1) a need for district public health units and facilities; (2) better nutrition including a high school lunch program; (3) better housing; (4) a safety program for accident prevention, and (5) an over-all recreational program. It was taken for granted that the public health service would supply the following: prevention and control of communicable diseases by immunization; x-rays; tuberculosis and venereal disease and cancer control; maternal and infant care clinic, and a program in sanitation. These needs were listed by farm people. No experts from the government helped to list these needs. The people knew the lack of a public health program from bitter experience. Extending public health care to rural America is one of the most important tasks before us today. With public health care must go a program of education and preventive medicine, some plan for paying the cost of illness and accidents to farm people.

DR. FLORENCE R. SABIN, Chairman, Interim Board of Health, Denver: In Colorado there are sixty-three counties, eighteen of which have preventive medical services. The eighteen counties include those with large cities, so that one half of the population is really covered with preventive medicine. The rural areas still need to have basic health services set up, the fundamental things, the things that have to be proved over and over again to be of real value to the people.

I want to stress the basic services that should be given to the people of rural America. There are six of them well known to everyone working in public health.

First, the control of communicable diseases: We still have 150 cases of diphtheria per year in Denver. Diphtheria is an outstanding example of the diseases which can be controlled. Our school children are protected. It is the preschool child who is not protected in a backward state. Second, environmental sanitation: Each county, each district, each group of counties needs to have good sanitary inspection. We have just begun these services in Denver. It is an educational program to teach persons in occupations that affect the health of their neighbors how to work in an expert manner and, from the standpoint of health, in a clean manner.

The program is difficult because it involves training adults to break habits that are bad. When you set up your services, don't expect your health officers to do this difficult job in a short time.

Third, laboratory services: Every health department needs the division of laboratory services. It is especially important to get adequate laboratory services on the western slope. Colorado is divided by the Continental Divide, and by the time one gets materials and reports back from the state laboratory it is sometimes too late. It is essential for us and probably for other states to have well developed laboratories scattered through the state.

Fourth, vital statistics, keeping adequate birth and death records. Fifth, the division of hygiene, maternity, infancy and childhood: It is vitally essential that this group have the most adequate health preventive services. There are special rural problems that I want to stress. First, this problem of animal diseases, for instance, brucellosis. A survey in Michigan showed that each cow infected with Bang's disease produced about 2,000 pounds less milk per year than a normal cow, and it was estimated from the number of diseased cows in Michigan that there was a loss of 222,000,000 pounds of milk per year.

Our loss in Colorado on the same basis is 37,000,000 pounds of milk per year. The figures for the United States must go into the billions. What might that milk mean to the welfare of the world?

The next rural problem is rodent control. We have now in Colorado an expert who, for the first time in all history, cleared out the rats for our stock show, a big event in Colorado. Not a rat was there. We know how to do it.

Rural Dental Health Problems

Dr. LON W. MORREY, Editor, Journal of the American Dental Association, Chicago: At least 95 per cent of the American people suffer from some form of oral infection. Studies indicate that American children between 6 and 18 years of age require about 244,000,000 fillings to place their mouths in a healthy condition and that once this backlog of accumulated need is met dentists would have to insert an additional 33,000,000 fillings per year to fill the annual increment of cavities in that age group. Cavities develop in children's teeth at a constant rate, 1 carious tooth every sixteen months, or three quarters of a tooth per year. Among adults there is an average need for 4.5 fillings and more than two extractions. About 1 of every 4 adults needs one or more bridges, while 1 of every 6 requires full dentures.

The few studies that have been conducted to show the relative incidence of dental disease in rural and urban areas indicate that there is little difference between urban and rural dwellers as far as the incidence and prevalence of dental caries is concerned. This is not surprising, as both groups are exposed equally to the conditions that cause dental caries. Most research workers agree that

decay of the teeth is caused by the overconsumption of carbohydrate foods, particularly sugars. City and farm dwellers set essentially the same table, and both consume a larger quantity of sugar than in previous years. There is little likelihood that the American people will reduce their consumption of carbohydrates, even though they know that caries will result. Until some simple measure is discovered that will counteract the caries-producing effect of sugar both urban and rural dwellers must resign themselves to the discomfort and dangers of dental disease or avail themselves of early and regular dental care.

The unequal distribution of dentists in Illinois is typical of a condition that exists in most states. A study made by the Committee on Economics of the American Dental Association showed 6,116 dentists licensed to practice in Illinois, or approximately 1 dentist to 1,300 persons. The distribution of dentists in this state, however, is decidedly uneven. The Chicago metropolitan area has over 9 dentists per ten thousand population, while the southern section of the state has but 3.5 dentists for the same number of persons. This uneven distribution of dentists exists in practically every state. There is strong tendency for recent dental graduates to return to their home communities to practice. Since the majority of dental students come from metropolitan areas, the majority of dentists locate in those areas, with the result that some cities have more dentists than are needed and many rural areas have too few. For some unknown reason, few rural students are attracted to dentistry.

Between 1930 and 1944, dentistry graduated about 1,700 students annually and the profession lost about 2,200 dentists per year through death and retirement. During the two years since 1945 dental schools in the United States have graduated about 2,600 dentists per year, and there is every prospect that our forty schools will be filled to capacity for several years to come. However, even though dentistry is able in the future to graduate 2,600 dentists per year, this number is not sufficient to replace those lost annually and to take care of the increasing demands for dental service. Furthermore, the slight increase in the number of dental graduates for the past two years is not in proportion to the increase in the population.

The American Dental Association fully recognizes the problems involved in improving the dental health of the American people, and the association is attempting to meet those problems by encouraging: (1) dental research; (2) educational programs that will motivate persons to avail themselves of early and regular dental attention so that they may avoid expensive restorative service, and (3) dental service programs for those who cannot provide service for themselves, particularly service programs for children, as dentistry for children is the best method known to control dental caries. The dental association is attempting, through its state and local societies, to encourage more qualified young men and women from rural areas to enter the profession. Until our dental educational facilities are expanded the number of dental graduates each year will be inadequate to meet dental demands. The association is encouraging the establishment of additional dental schools. There are prospects that two, or possibly three, new schools will be established in the near future; even so, the additional number of graduates will in all likelihood be insufficient. Therefore, the association recommends the employment of more qualified ancillary personnel. It is encouraging the expansion of educational facilities for the dental hygienist and the dental technician, and it is encouraging the employment of more dental assistants.

Finally, the American Dental Association, through its Council on Dental Health, is encouraging the establishment of state and local councils on dental health. These councils, composed of representatives of dental, medical, educational, civic and other lay groups, are stimulated to study local dental health problems to analyze needs and then develop a practical community dental health program. Representatives of farm groups should become active members of the local dental health council. No one dental health program for the United States will ever be satisfactory. Each community, whether it be rural or urban, must understand its own problem; recognize its own needs; evaluate its personnel, facilities and funds, and determine its own desire to improve its own dental health. Even though the obstacles may seem insurmountable, most communities, armed with these facts and motivated with a determination to reduce dental disease, can develop a dental health program which, even if not adequate, will be a decided improvement over the one that now exists.

Discussion

DR. ETHNA B. WINSTON, South Carolina State College, Orangeburg, S. C.: Is there any arrangement whereby a cooperative plan may be provided for the training of persons to do the health services, whatever they may be, other than or in addition to physicians and dentists, particularly in the rural areas.

DR. CROCKETT: That is an interesting question, and something must be done. Just how it should be done is beyond my experience.

DR. FLORENCE SABIN, Denver: The facilities for training persons in public health are meager anywhere, except in the eight or nine basic schools. We have no school in the Rocky Mountain area for training public health workers. We hope to establish one. The medical school has a course for undergraduates in medicine in public health, and Negroes are admitted to our medical school.

DR. A. W. BROWNING, Elloree, S. C.: It has been said that doctors down south do not treat the Negroes. One half of my work is with Negroes. I believe it was last year or two years ago that I drove 7 miles in a buggy and 2 miles on dirt road to a Negro house to give treatment. In our section we don't refuse treatment. I just didn't want anybody to say we didn't treat them.

J. S. JONES, St. Paul, Minnesota: Dr. Sabin elaborated on brucellosis as an economic scourge to the animal industry. Would you please elaborate on the parallel cause of undulant fever to human beings?

DR. FLORENCE SABIN, Denver: Dr. Stiles, who has now come into the Colorado state department of health, is trying to get accurate data on the amount of human infection. It is a difficult task. Accurate data is obtained by making the agglutination test and getting the history of every single patient as to whether he had any vaccination or not. As far as the skin test is concerned, Dr. Darling, who is here at this conference, made an estimate that about 15 per cent of the inhabitants in Colorado have a positive skin test. Of course, that doesn't indicate the amount of infection. Those of us in public health believe that the amount of true infection is greater than is commonly recognized. We still await accurate data.

MRS. JEROME EVANSON, Jamestown, N. C.: Dr. Sabin, how do you get personnel for your public health district units? In North Dakota we are ready to move out in district units in every county in our state, but we are told we cannot get personnel. One more question. When we cannot get the full time

service of a public health physician for our district, would you recommend that we take the part time services of local physicians?

DR. FLORENCE SABIN, Denver: I am convinced from the little that I have seen, and I am only a novice in this public health work, that specific training in public health is tremendously important. That was why I stressed the big educational problem. I believe that training in public health teaches the worker how to get people to cooperate. It is really a matter of expert education.

DR. BEAUDRY, Montreal, Canada: Emphasis has rightly been placed, since the beginning of this conference, on preventive medicine. But I would like to dwell on the problem of tuberculosis. In the United States the mortality rate has been reduced to 35 for hundred thousand population, and if the trend keeps on going for a few years more, it is thought the mortality will come down to 15. This is wonderful work, but what about the lives which are still lost through tuberculosis? The answer is simple, because we have BCG vaccine for use against tuberculosis. This has proved of value in contaminated families. A doctor in Montreal and a doctor in Saskatchewan have obtained 70 per cent reduction in infected families where the children have been given the vaccine at birth. This has been done while the children were not separated from the infected patients, but when this separation is made, as we have done in close to 1,000 newborn children in Montreal, the reduction has been close to 100 per cent. Vaccines are being studied at present in this country by the U. S. Public Health service. We hope that the United States will come in line with other countries which give the opportunity to all physicians to use the vaccine.

DR. M. P. NEIL, Columbia, Mo.: I cannot allow the question of undulant fever to go unchallenged. I am sure Dr. Sabin will agree that the skin test is no more diagnostic of brucellosis than a skin test is diagnostic of tuberculosis. I am sure all who are familiar with the disease agree that the agglutination test is not a conclusive diagnosis of undulant fever. There is one absolute diagnosis, and that is recovering the organism from the blood.

DR. FLORENCE SABIN, Denver: I agree, and it is well known that a patient or an animal may have a negative agglutination test, and the next day the organism may be recovered from the blood. We should go on and eliminate this disease from the animals that are the source of the infection.

DR. D. G. MILLER JR., Morgantown, Ky.: During the war when the state health department in Kentucky was weighed down with selective service examinations, there was an incidence of brucellosis of about 5 per cent positive agglutination. Another problem that must be contended with is means to stop transportation of the infected cows over the state line. I know of 25 or 30 cows that have been brought into Illinois and sold from my own county in Kentucky because the owners could sell them as high grade milk cows in Illinois but didn't dare try to do that in Kentucky. They have taken animals to Alabama, Missouri and Tennessee in that area. I further know that these small milk producers go to the stockyards and buy these cattle and start putting the milk in the pool which they offer for sale without testing. When the veterinarian catches them, they take the cow out. That cow's milk may be sold for weeks before the cow is tested for brucellosis or tuberculosis. That is one phase of the problem for which we are going to ask for help. I am opposed to federal aid, but this is one time when we should have it.

MISS JUNICE DALEN, Willmar, Minn.: I would like to know if the American Medical Association is in favor of having these public health units set up on a county basis or a multicounty basis, and second, if so, are we to understand that they will give active support for legislation which will help us get the public health service? We had a bill introduced in the last session of the legislature which was defeated, and we are going to introduce it again at the next session.

DR. CROCKETT: The American Medical Association was among the first a hundred years ago to champion public health and the creation of a public health service, and they have consistently championed that idea. The American Medical Association speaks merely on a national level. It does not go into any state and tell a state group of physicians what they must do. It does stand for the very best in public health service.

J. S. JONES, St. Paul, Minnesota: The state medical society has endorsed the program in Minnesota and is active in promoting it at present. There was some misunderstanding in the last legislature. I would like to mention public health medical personnel and public health institutions for tuberculosis and institutions for the care of the insane. If you want good personnel in these fields, you cannot simply rely on education. You have to change the thinking of our people so that personnel can be employed in those institutions at a level of pay comparable to that of a practicing physician. In the past year, we have had three trainees' funds to pay a physician $300 per month if he would go to school and learn public health. We couldn't get a taker.

DR. FLORENCE SABIN, Denver: In our state medical association we had the full cooperation of our physicians. We had the same experience. Our bill failed one year; the next year we all got together, and the public health people and the medical profession wrote the bills together. We each made some concessions in writing the common bills, which then were presented to the legislature with the backing of the public health services and the physicians who went to the legislature and fought day in and day out just exactly as hard as the public health people. The point is to get cooperation long before your state legislature meets.

We have the same problem with regard to salary in Colorado. We got the salaries in Denver up to fairly adequate levels. It is terribly hard to get the state salaries up. You simply have to educate your total population and get across to the people that it is worth while to spend money for health.

MISS MARGARET STEIN, Washington, D.C.: Dr. Crockett, would the American Medical Association support federal legislation granting funds to the state to provide more public health units and serve the 30,000,000 persons not covered by full time health departments? To my knowledge there is no such legislation. However, it has been recommended occasionally before committees.

DR. CROCKETT: Federal money is available, I believe, to the state public health departments for certain definite purposes. The policy, if it has not been settled by the American Medical Association, would be a matter for action by the House of Delegates. They are the only group within the profession that would be qualified to set a policy.

DR. ROBERT E. ARCHIBALD, Melrose, Mass.: I have a few copies of a proposed bill that it is hoped will be introduced in Congress this year to get an appropriation to be used entirely for the development of local health units and the training of personnel.

Olmsted County Child Health Project

DR. FLOYD FELDMAN, Director, The Rochester-Olmsted County Health Unit, Rochester, Minn.: The title on the program is misleading, as there is no Olmsted County Child Health Project. There is a Rochester Child Health Institute, which was formerly called the Rochester Child Health Project. This institute has limited its research program to the city of Rochester, but its services reach all parts of Olmsted County.

The Rochester Child Health project began operations in January 1944. It has two purposes, research and service to the children of Rochester. This project, headed by Dr. C. Anderson Aldrich, is attempting to provide the best maternal and child health supervision possible for mothers and their babies born in Rochester. The staff has grown to include an assistant director, psychiatrist, two psychologists, nutritionist, director of preschool activities and a statistician.

The Child Health Institute plans to carry its observations and supervision from the prenatal period to adult life on every baby born in Rochester. The city health department, the city public schools, the county board of commissioners, the state board of health, the W. K. Kellogg Foundation and the Rochester Child Health Institute all contribute funds and services. To bring them together, the Rochester-Olmsted County Health Unit was formed, with an administrative council and an advisory committee. The health unit is not an official governmental entity but a voluntary group, without funds of its own, for the sole purpose of coordination. The city health officer is permanent chairman of the administrative council.

Three half-day prenatal clinics are conducted each week at the Rochester City Hall for rural and city patients. The clinics are conducted by fellowship physicians from the Mayo Clinic. During 1947, 114 patients from the city and 127 from the rural area attended these clinics. In the same year there were 708 births in the city and 506 in the rural part of Olmsted County. The public health nurses made 1,125 home visits to these women last year before their babies arrived.

At the time of delivery in the hospital, a record is started which is expected to follow the child to maturity. The mother is instructed in the care of her baby and what she can expect in the way of normal behavior and development. Every effort is made to encourage breast feeding.

For children born at home under the care of the few private practicing physicians, and 13.6 per cent of the rural resident babies are born at home, this period of training and instruction must necessarily be more limited. When the baby and mother are ready to go home, the hospital notifies the public health nursing service, and a home call is made immediately to get the mother started on her routine. Subsequent home calls are made when necessary, but most supervision is carried on through the child health clinics. These clinics are closely supervised. The rural clinics are held at different centers at such intervals as to provide a monthly clinic to any one area. The same physicians work in both rural and city clinics, although only the city children belong to the institute research group. Mothers are encouraged to bring babies in once each month for the first year, then every two months until 18 months of age, every three months until 2 years of age, then every six months until school age. Immunizations are started at 6 months of age for whooping cough, smallpox, diphtheria and tetanus. Under the direction of the Child Health Institute, a local lay board conducts several nursery schools for the preschool children who need such experience. There are not enough preschool classes to meet the need, but more are being organized. Unfortunately, none of these are operating in rural areas, where they are probably as much needed as in the city.

The Rochester Child Health Institute furnishes many services in the school health program. In the city, physical examinations are given to all entering children, all those referred by nurses and teachers, and those in the fifth, ninth and twelfth grades. These examinations are preceded by teacher-nurse conferences, vision tests, height and weight measurements and planning conferences. Although no free medical care is given through the schools, most of the significant deviations from the normal are taken care of through the parents' private initiative and funds or with the help of welfare agencies and service clubs.

An immunization program for smallpox, diphtheria and protection against tetanus is offered in the schools each year for additional protection of those given inoculations in infancy.

The dental program has as its aim the annual examination by a private dentist of every child over 3 years of age. Cards are given to the school children to be signed by the dentist and returned. Results vary from 100 per cent in some schools to few or none in others. Reasons for low percentages in certain schools are now being investigated.

A special roster of crippled children is maintained so that no child will be neglected, and the many orthopedic services available here have been fully used. A complete register of tuberculosis cases and contacts is maintained. Roentgenologic and tuberculin tests are offered at little or no cost. The county, with seven others, maintains an excellent sanatorium which has enough beds for all active cases. A counseling clinic for those of all ages with a psychiatrist in charge has been operating now for seventeen months. The city restaurants are regularly inspected and utensils cultured. A survey completed recently gave our eating and drinking establishments an average rating of 72 per cent, according to the code of the U. S. Public Health Service. Rural milk supplies, water supplies, rural eating and drinking places and the rural schools have had little sanitation service, and the need is great. In 1947, the expenditures for these were as follows:

Rochester Board of Public Health and Welfare	$38,618.51
Rochester City Schools	$12,108.22
Olmsted County Board of Commissioners	$ 6,093.94
Minnesota Department of Health	$ 7,630.18
University of Minnesota	$ 1,674.75
W. K. Kellogg Foundation	$18,716.65
Mayo Clinic	$ 1,674.18
	$85,256.39

This amounts to $1.66 per capita, not counting the services furnished by the Mayo Clinic and the Rochester Child Health Institute. As judged by a maternal mortality rate of 0 per thousand births and an infant mortality rate of 17.3 per thousand births, we can look forward to greater reductions in morbidity as well. One of our greatest hopes is that a modern approach to health supervision of the child will materially lessen the numbers of poorly adjusted children with a consequent decrease in child delinquency and adult mental disease.

Rural Youth Looks at Health

MR. EDWARD H. MERTZ, Executive Secretary, Farmers Educational Foundation, Denver: For the first time in this series of health conferences we have brought in with us the farm young people. My colleagues in this panel represent the American Farm Bureau Federation, the

National Grange, the National Milk Producers Association and the National Farmers' Union. These farm organizations are members of the Rural Medical Service Advisory Committee of the American Medical Association.

These farm organizations propose various programs to provide better health services for rural people. We are not confined in our thinking to the organizations which we represent or to the areas represented by members of this panel. We are talking about the problems of the 6,000,000 farmers in America and the 30,000,000 persons who make up these families. We know that 40 per cent of the wives of farmers of low income have neglected childbirth injuries; 10 per cent of their children are seriously underweight, 48 per cent have defective tonsils and 65 per cent have decayed teeth; 14 per cent of all farm mothers have no hospital care when the babies are born. We know that regardless of what you call the process, over half of the young men from farm homes were rejected by selective service. As citizens representing farm youth, we have a responsibility to build a strong America. We shall try during this panel to analyze the causes of this unhealthy rural America and explore the way that persons in rural areas might provide themselves with adequate health services.

The first presentation of this panel will introduce the general problem, and the second and third presentations will give you a background of what farm organizations are doing, and the final presentation will give you a picture in terms of program and philosophy of what rural residents think that we should be doing.

It was difficult to arrange this panel in the strict sense of the word as these folks live in four states and, unfortunately, I live in another one. Arrangements were made by correspondence up until 11 o'clock last night.

MISS RUTH PARSONS, Chairman, National Rural Youth Committee, American Farm Bureau Federation, Fowlerville, Mich: Rural health is not just a problem of the American Medical Association. It is the problem of everyone, and as soon as everyone becomes aware of that, something will be done about it. With lay persons assuming more of the responsibility in getting these facilities for improvement of rural health there may be some difficulty in understanding the way that it should be brought about. The farmer has a most intricate profession, one that requires able-bodied and mentally alert workers. The best crop raised on the farm is the children. One hundred thousand persons in a certain city in one generation failed to reproduce themselves by 33 per cent; yet the cities are growing larger. Where are the people coming from? The urban areas are failing to reproduce themselves by 26 per cent and the rural areas are overproducing by 44 per cent. We figured out the health problems, which the rural residents classified in four groups: (1) nutrition; (2) poor health education; (3) lack of health units and hospitals, and (4) that rapidly decreasing person, the general practitioner. Unless the farmer's wife knows why her family should have vegetables and fruits and which ones and how often, those on the farms are going to eat what they do now: meat, potatoes and sweets. She has to know how to pick foods that have the highest food value. There is a serious lack of community health services. Two fifths of the counties are without a full time health department. In our community they are trying to get one started. Only three fifths of the counties have registered hospitals, and most of the hospitals are concentrated in the urban areas. Those in rural areas are not equipped as they should be. Michigan pioneered, I believe, a great deal of the work in both the medical groups and the farm bureau in getting the Blue Cross Hospital Plan. The farm bureau in that state offers all members drastically reduced prices, and this is doing a good deal to improve conditions. The Hill-Burton Act will increase the amount of hospitals in the rural area. One would think that in view of those facts there would be more physicians in the rural counties. Only one of a graduating class of young physicians is going to settle in a rural area. Is it the fault of the medical schools? Do they advocate specialization? Is it the fault of the physician? I don't know whose fault it is, but it is something that will have to be changed. I was going to tell you what the Junior Farm Bureau does. It is made up of representatives of the midwest section, who have worked for community health centers. One county has started the groundwork for a hospital. Most of the counties do similar things. They work in their own area rather than on a statewide basis. I hope that this is not just a discussion, but that a great force for the improvement of rural health will come out of it.

MISS MARTHA KOHL, Secretary, Genesee County Chapter, Dairymen's League, Corfu, N. Y.: There was a time when living in the country was considered especially healthful and was presumably the best way to raise children. But one fourth more rural babies than urban infants die in their first year. The rural child runs a greater danger than the urban child of dying from measles, scarlet fever, whooping cough and other diseases frequent in childhood, which modern medicine is quite successful in preventing. Perhaps the rural people should accept the blame for these conditions. We have never provided a plan to make preventive and curative medicine readily available to everyone. We have left pretty much to chance the distribution of doctors, dentists and nurses. We have left to the doctors the entire responsibility for providing their own equipment. Often we have left even the building of hospitals to the medical profession. Forty per cent of the 3,070 counties in this country have no hospital worthy of the name. The cities average a physician for every seven hundred persons, while rural communities average one for seventeen hundred persons.

But statistical averages do not tell the whole story. They mean little to the residents of Dubois, Wyo., who are 70 miles from a doctor. In 1944 every able-bodied physician in Taos County, N. Mex., had 6,134 potential patients, as shown by a check of the Farm Security Administration. Such conditions can be corrected through the Federal Hospital Survey and Construction Act if the rural people accept the responsibility and make the most of this opportunity. The lack of sanitation facilities presents a problem. Recently, the entire supply of drinking water in a neighboring village was found to be contaminated. Authorities believed that the improper disposal of sewage was the cause of the trouble. A program to inform rural people of the importance of this problem is necessary as the population of these areas is constantly increasing.

Accidents on the farm take the lives of many persons. Machines have become a menace to the well-being of the farm family. Other industries are required by law to provide safety devices and to compensate those injured, but little has been done to prevent accidents from use of farm machinery. In addition to the national and state safety programs there is a need for community organization

to fight carelessness. The New York State Grange has recognized the need, and lecturers devote a part of each meeting to safety. A new film on farm safety, "Miracle in Paradise Valley," will be shown this coming year before all the granges and is available for other groups.

A column devoted to rural health in the monthly *Program Letter* to women of the Dairymen's League brings them information of all kinds. Essay contests in schools, play writing, menu contests and exhibits for meetings, fairs and field days are a few of the activities which include the youth in our health education program. The need of producing clean milk was taught through plays, movies, discussions and speeches at community meetings.

The New York State 4-H Clubs have for several years been guided in their health program by a committee made up of club agents, specialists and members of the 4-H administrative staff, with representatives of the various state departments and other organizations.

The objectives of the 4-H Health Improvement Project as set up by this committee are: (1) to encourage the correction of remediable defects; (2) to help young persons to develop sound bodies and mature personalities; (3) to encourage the acquirement of knowledge, skills and good habits related to health and safety; (4) to help youth share the responsibility for improving home and community health conditions, and (5) to help 4-H members and leaders to develop the goal, 'Building Health for a Strong America." Many club programs included individual improvement in health, assistance in poliomyelitis drives, a drive to get every member to have roentgen examination of his chest, health exhibits, milk sanitation, fire prevention, vaccination clinics, first aid training, farm safety, and nutrition and food preparation projects.

The farm youth of America will accept their part in the health and safety programs.

MISS HETTY CHANDLER, Youth Committee, Farmers Educational and cooperative Union of America, Jamestown, N.D.: I would like to speak for those of us who want to live on the farm because to us there is no more satisfactory way of living. I would like to speak particularly for the Great Plains area. In the more heavily populated sections the problem is not so much lack of services as inability to pay for needed services. Both these major problems confront us in the Great Plains states, where the population is sparse and the distances are great. Our income is subject to great variation because of weather and crop conditions.

How does this affect our health problems? Here are some facts from my state. Twenty one of fifty three counties do not have a hospital. In many of those counties one must travel 50 to 100 miles to a hospital over gravel roads, impassable most of the winter. When the last survey was made, 67 per cent of the people lived in areas where the number of doctors is much less than the minimum standard of one doctor to 1,500 persons. Eighty-five per cent of our people are not covered by public health services, and in our entire state there is only one public health district functioning to provide preventive care to those who dwell outside of a big town. When crops are not good and prices are low we cannot afford medical care, and it is postponed until our illnesses are really serious. Statistics usually show averages and do not point out the great discrepancies of the kind I have tried to show that exist in North Dakota. The farmers' unions and rural organizations are deeply concerned about this situation; our program follows also a threefold pattern in the field of education. Farmers are meeting to discuss the over-all health situation and to study the need of their communities. They discuss information booklets to make them health conscious. The main emphasis in this education work is on the active participation of all persons in health programs. The Farmers' Union has held health meetings and workshops. At these workshops we try to make people aware of what facilities they have available to them. We also want to give them an opportunity to discuss their community health needs and to plan together to meet those needs. It is thrilling to see persons without specialized training in health study their problems at these workshops and become articulate in developing an activation program to meet their needs.

We have encouraged the development of community cooperative hospitals, clinics and prepaid insurance. We have one Farmers' Union insurance plan that offers hospital benefits and accident and death benefits, and this past year we aided in making insurance provisions to cover the cost of surgery as well. The Farmers' Union is working for a national insurance plan because, while we cannot overlook the valuable pioneering work done by the voluntary prepayment plans, they cannot cover all the persons who need medical care. We have seen the miracles of modern medicine as it faced the challenge of global war, and we seek to combine the best of these experiences in a rural health program. We are preparing to do some of these things in rural areas in the great plains. We need more hospitals in most rural areas and we can plan them for the places where they will serve the greatest need. In our rural hospital building program, we are not forgetting to make provision for nursing homes and wings on the hospitals to care for aged persons and chronic invalids.

The State Health Planning Committee in North Dakota with a group of representatives of interested organizations has developed a fine program for building rural hospitals. We need not only more health services but adequate housing, accident prevention, good roads and communication, creative recreation and a more stable income. Any advances we can make in any of these fields is also a gain for health. There is no reason why the barriers confronting rural residents in securing health care should persist, and we intend to work to help remove them. Many rural young people are taking medical and public health training and becoming nurses, hospital administrators and dentists with the desire to return to rural areas to serve. They are counting on those at home to set up clinics, health units and hospitals and to develop a prepayment plan to insure that the people can use the facilities, so they can return to rural areas to work and make their homes. They are counting on the cooperation of everyone in the development of better health services.

ELBERT HUTCHISON, Xenia, Ohio: *Health Facilities and Needs in My Community*. The Grange, the oldest farm organization in America, is most interested in the health of rural people. From our fields and homes come the wealth of America; if we are to continue to contribute so much, we must be ever mindful of the health of rural boys and girls. Some 36,000,000 Americans live in farm or village homes today, with about 89 per cent without bath or inside toilet, 82 per cent without proper water facilities, and 39 per cent with homes in too poor a condition to be repaired. The barometer of human welfare in our farm homes shows unnecessary illnesses, diseases, disabilities and deaths. In most farm communities, public health units are scarce and the supply of hospitals, doctors and nurses is inadequate. The quiet ravages of malnutrition go unchecked, babies are born without the care of a physician, and antepartum care, childbirth in hospitals and good care of the mother and baby are unheard of in many farm homes.

To guard our youth we must devise a method of putting the low paid farmer and sharecropper on a basis to compare with the average of workers in industry.

In cities about 72 per cent of the childbirths are in hospitals, and the mortality rate is very low. Medical neglect among farm mothers is about one-third more prevalent than among city mothers. The National and State Granges are advocating a health program which, if generally adopted, will benefit young persons everywhere. In addition to a State Health Committee, every county and every local Grange has a health committee. This committee encourages health programs in Grange meetings and encourages the setting up of health centers.

In my state there is a rural health organization made up of representatives of farm organizations and others. This committee meets regularly, and representatives from every county in the state attend an annual health meeting in Columbus. A rural health specialist who is a part of the Extension Service of our State Agricultural College assists. Regional meetings are held from time to time. These meetings encourage each community to have a health center with a well organized committee working in colaboration with the physicians and nurses. Their object is to make available to all citizens through educational material the information essential to healthful living. Many people who do not practice health rules are unaware that such rules exist.

In our school we have free roentgen examinations of the chest for all high school juniors and seniors. Money from the sale of tuberculosis stamps made possible the purchase of the x-ray machine. Lectures are given on the effects of alcohol and on personality problems of youth. This health education is fine, but there is not enough of it.

My community is fortunate in having a fine public health set-up. We must increase the income of the small farmer, low wage earner and sharecropper to the extent that he will have an equal opportunity to provide the health needs of his family. We need to cooperate in every respect to bring the health of our people up to high standards. Income alone cannot solve the problem. The people must be educated in a new way of living, and their lives changed until everyone will be on a basis of equality with regard to health. This can be done by cooperative groups supporting mobilized hospital and dental units, and centralized medical units and by the assistance of trained personnel.

MR. IRWIN JOHNSON, District Representative of the 4 H: I am not exactly the district representative, but in the absence of any one from the United States Department of Agriculture or the Extension Service, the people that administer the 4 H program, I have been asked to say a few words. 4 H stands for head, hand, heart and health. Over a period of years they have developed numerous projects, aimed at the improvement of rural living. They have safety contests on the farm, they emphasize nutrition, correct habits of sleep and other things necessary to good health. In 1946 there were 180,044 boys and girls who received health examinations through the program who could not have had them otherwise.

A new health program has been in operation for the past year. It has these broad objectives: the program should be planned on the basis of health needs of young persons for each community; it should be planned to cooperate with the local and state health authorities, and it must attract and appeal to youth. Thirty-seven states took part in it. After hearing these four young speakers today I am sure you are convinced that when they get an idea they want to go ahead with it. There are a million 4-H boys and girls around the country and there are many ways to help them do a more complete and satisfactory job.

MISS ELIZABETH ROBINSON, American Junior Red Cross, Washington, D.C.: The most hopeful thing I have heard at this meeting is the fact that you have put youth itself up here to talk to you. One of the secrets of success in this problem of health, is that we can't wait until the boys and girls grow up. We can't plan for either medical attention or education with complete success unless we let them take their part in the total picture.

(To be continued)

Washington Letter

(From a Special Correspondent)

May 29, 1948

International Centers for Study of Tropical Diseases

Establishment of international centers for the study of tropical diseases was proposed at the closing meeting of the fourth International Congresses of Tropical Medicine and Malaria. The Pan American Sanitary Bureau with headquarters in Washington was suggested as an informational source for coordination of studies of tropical diseases, especially those affecting persons in the Western hemisphere. Also advocated was a survey of world food deficiencies. It was proposed that the Food and Agriculture Organization and the World Health Organization of the United Nations take immediate steps to investigate and correct human nutritional problems. At the concluding dinner in the Mayflower Hotel, the Leveran prize for research in malaria was presented to Col. Henry E. Shortt, professor of protozoology, University of London, and the Walter Reed Medal to Dr. N. H. Swellengrebel, Amsterdam Institute of Tropical Medicine.

Code of Ethics for Specialists in Mental Disease

Dr. Winfred Overholser, superintendent of St. Elizabeths Hospital, stated in his opening presidential address to the American Psychiatric Association in session here that there is need of a code of ethics for the 5,000 United States specialists in mental disease. Although psychiatrists are bound by the professional code of the American Medical Association, the field of mental disease is not adequately covered by the rules; hence, much unfavorable publicity and sensational misinformation results. Dr. Walter L. Treadway, former chief of the mental health division, U. S. Public Health Service, heads an association committee which is working on an adequate code.

Civilian Defense Plan

The members of the medical profession will play a major part in civilian defense. The Arlington Country, Virginia, Board has approved plans for a comprehensive civil defense program in case of atomic war, the first in the area of the District of Columbia. One job will be to locate everyone with any medical training, including veterinarians, to provide treatment in case of mass casualties.

Dr. Justin K. Fuller to Retire

Dr. Justin K. Fuller will retire next month as medical director, Federal Bureau of Prisons, and medical chief, Maritime Commission's training bureau, Surgeon General Schools of the Public Health Service has announced. Dr. Fuller will be succeeded by Dr. Stanley E. Krudbiegel at the Bureau of Prisons and Dr. Daniel J. Daley at the Maritime post. Dr. Fuller will become medical consultant to the California Department of Corrections.

GOVERNMENT SERVICES

ARMY

OFFICERS SELECTED FOR SPECIALIZED COURSES

The Surgeon General announces the selection of the following officers for specialized courses in civilian and governmental institutions: Lieut. Col. Charles B. Perkins to be assistant resident in radiology at Massachusetts Memorial Hospital for two years, during which time he will also serve as professor of military science and tactics; Lieut. Col. Warren H. Diessner, training in allergy at the University of Illinois College of Medicine, Chicago, during which time he will serve also as assistant professor of military science and tactics; Major Edward H. Vogel, course in surgery at Tulane University School of Medicine, New Orleans, during which time he will serve as assistant professor of military science and tactics; Lieut. Col. William W. Currence, training in pediatrics at the University of Colorado School of Medicine, Denver; Lieut. Col. Theodore L. Hartridge, residency in otolaryngology at Washington University School of Medicine, St. Louis, during which time he will serve also as professor of military science and tactics.

ARMY INSTALLS ELECTRON MICROSCOPE

The electron microscope recently acquired by the Army made its first public appearance May 17 during the fourth International Congresses of Tropical Medicine and Malaria in Washington, D.C., May 10-18. Some 300 of the 2,000 persons attending the congresses viewed the microscope during open house at the Army Medical Department Research and Graduate School on the grounds of Walter Reed Hospital.

DR. SLOAN APPOINTED CURATOR OF MUSEUM

The Army Institute of Pathology, Washington, D.C., announces the appointment of Dr. Ruell A. Sloan as curator of the Army Medical Museum. Dr. Sloan is a graduate of the University of Rochester School of Medicine and has been on the faculty of Harvard Medical School, the University of Buffalo School of Medicine and St. Louis University School of Medicine. He served five years during the recent war as chief of laboratory services at an Army hospital and later as pathologist and executive officer of the Army Institute of Pathology. On leaving the service he was appointed assistant director of the institute and acting curator of the museum. He is a member of the American Board of Pathologists and president-elect of the Washington Society of Pathologists.

PERSONAL

Joseph H. Wagner, Ph.D., former head of the nutrition research section of Libby, McNeill & Libby, Blue Island, Ill., has joined the staff of the Quartermaster Food and Container Institute for the Armed Forces in Chicago. Dr. Wagner is said to have published numerous papers in the fields of biochemistry and nutrition.

Capt. James L. Hansen, M.C., who reported for duty at the Army Institute of Pathology on April 15, recently returned from the 49th General Hospital, Tokyo, Japan, where he was chief of laboratory service.

PUBLIC HEALTH SERVICE

FULL TIME EMPLOYEES IN STATE HOSPITALS

Personnel shortages in state mental hospitals are less acute now than in war years, but this gain is offset by more overcrowding and higher maintenance costs, according to 1946 figures compiled by the Mental Hygiene Division of the Public Health Service. There were 70,962 full time employees on the rolls of state hospitals at the end of 1946, making a ratio of 6.2 patients per employee. This ratio indicates a continuation of the decrease in the number of patients per employee which began in 1945, and represents a reversal of the upward trend which occurred during the war years. The percentage by which the average daily resident-patient population exceeded normal capacity increased from 12.3 in 1945 to 16.3 in 1947, and the per capita expenditure for maintenance rose from about $387 to $437 in the same period.

The figures are based on the results of the 1946 Census of Patients in Mental Institutions, collected and tabulated by the Bureau of the Census, Department of Commerce.

NEW ENVIRONMENTAL CANCER SECTION

Dr. W.C. Hueper has assumed his duties as chief of the new environmental cancer section of the National Cancer Institute in Bethesda, Md. In its announcement, the U. S. Public Health Service points out that there has been relatively little systematic study of cancer-causing factors in industry. It seems clear that part of the increased incidence of cancer is linked to the growth of industry during the past hundred years and to the dangers of prolonged exposure to certain substances. The recent first step in the environmental cancer control program was a grant to the Roswell Park Memorial Institute in Buffalo for a study of causes of occupational cancer among male patients coming to the institute for treatment. The new program includes the establishment of an occupational research laboratory at Georgetown University Medical School where investigators can study environmental factors in cancer. Dr. Hueper, a native of Germany who came to the United States in 1923, is the author of many publications in this and related fields. At present he is president of the American Society for the Study of Arteriosclerosis.

INFANT MORTALITY RATE DROPS

The infant mortality rate in 1946 was 11.7 per cent less than the rate in 1945, according to figures of the National Office of Vital Statistics. The number of infant deaths which occurred during 1946 was 111,063. The five leading causes of death during infancy were: premature birth; congenital malformations; pneumonia and influenza (combined); injury at birth, and diarrhea, enteritis and ulceration of the intestines (combined); 33.9 per cent of all deaths occurred under 1 day of age.

25.6 per cent during the remainder of the first week and 11.7 per cent during the second, third and fourth weeks. The highest infant mortality rate was 78.2 for New Mexico and the lowest was 27.2 for Utah. All but five states experienced a decrease in their infant mortality rates between 1945 and 1946.

SHARP RISE IN BIRTH RATE

A sharp rise in the birth rate in 1946, the first postwar year, was general throughout the country. Data prepared by the National Office of Vital Statistics of the U.S. Public Health Service indicate a total of 3,288,672 registered live births, an increase of 553,000 over 1945 and 354,000 over 1943. The 1946 final birth rate of 23.3 per thousand population including the armed forces overseas was an increase of 18.9 per cent over the rate (19.6) in 1945. The increase in the 1946 birth rate for the white population was more than twice as large as for the nonwhite. The largest increases were in the North Central and Middle Atlantic states. The 1945 state birth rates ranged from a high of 34.9 per thousand civilian population in New Mexico to a low of 20.6 in Massachusetts. Residents of the Mountain and Southern states generally had the highest birth rates in 1946, residents of the New England and Middle Atlantic states the lowest. This is similar to the pattern for 1945. The demobilization of the armed forces in the latter part of 1945 contributed to the sharp rise in the number of births during the second half of 1946. The rates for the early months of 1946 were at about the same level as those which prevailed during 1945.

MISCELLANEOUS

STAFF TO SUPPLY SCIENTIFIC INFORMATION

Dr. George E. Burch, Henderson professor of medicine, Tulane University School of Medicine, New Orleans, has been appointed to the staff of the scientific office of the Mission on Science and Technology recently established by the State Department as a permanent part of the United States Embassy in London. His appointment is for a period of three months. Other scientists on this staff are Earl A. Evans Jr., Ph.D., chairman, department of biochemistry, University of Chicago; Joseph B. Koepfli, Ph.D., of the California Institute of Technology, and Dr. Warren H. Cole, professor of surgery, University of Illinois School of Medicine, Chicago. The principal duty of the staff is to supply information concerning current developments in science and technology in the United States.

NUCLEAR PARTICLES PRODUCED FOR THE FIRST TIME

Dr. James B. Fisk, director of research, Atomic Energy Commission, Washington, D.C., and Dr. Ernest O. Lawrence, director of the Radiation Laboratory at the University of California, announce that nuclear particles, mesons, heretofore found only in cosmic rays, have been produced artificially for the first time at the Radiation Laboratory in research carried on for the Atomic Energy Commission. The liberation in the laboratory of these cosmic ray particles, one of the major objectives of research for the past decade, is regarded by scientists as the most significant event in fundamental nuclear science since discovery of uranium fission. However, no practical applications, such as fission, are now in sight. Dr. Lawrence said that this development opens up unprecedented opportunities for the understanding of mysterious subnuclear processes. In announcing the new achievement of the latest model of the cyclotron which Dr. Lawrence invented eighteen years ago, he gave full credit to the two men who performed the experiments: Dr. Eugene Gardner, research physicist at the Radiation Laboratory, and Dr. C.M.G. Lattes, a Brazilian scientist who came to Berkeley recently on a Rockefeller Foundation fellowship. Dr. Lawrence said that super atom smashers must be built in order to exploit fully the realms of nuclear knowledge which lie still deeper within the atom.

ADDITIONS TO STAFF OF OFFICE OF EDUCATION

The Office of Education, Federal Security Agency, Washington, D. C., announces the appointment of Dr. Cyrus H. Maxwell, Delmar, N. Y., as chief of administration of School and College Health Services, and of Max Herbert Freeman, Ph.D., Montclair, N. J., as specialist in the Business Education Service of the Division of Vocational Education. Dr. Maxwell was for many years chief of the Bureau of Health Services, New York State Department of Education; previously he was medical supervisor of the public schools of Auburn, N.Y., and engaged in the private practice of medicine. He served during World War II and is president-elect of the American School Health Association. Dr. Freeman was formerly professor of business education and head of the department at New Jersey State Teachers College in Paterson. He is co-author of several teaching manuals.

FELLOWSHIP TRAINING FACILITIES

The U.S. Atomic Energy Commission announces that facilities to train holders of fellowships in biology and medicine will be established in North Carolina, New York, Texas, Colorado, California and Oregon in time for the school year beginning this year. The program of fellowships recently established by the commission also allows fellows to train at other institutions.

One problem in the fellowship training program is the shortage of university faculty members who have the necessary specialized training. The commission therefore is arranging a series of courses for the coming summer to give advanced training to faculty representatives at the participating universities. Summer courses will be held at the University of California, Los Angeles, with Dr. Stafford Warren as director; the Institute of Nuclear Studies, Oak Ridge, Tenn., Dr. William Pollard, director, and the Brookhaven National Laboratory, Long Island, under a director to be appointed. Administration of the fellowship program, including the selection of candidates, will be undertaken for the commission by the National Research Council. Applicants from any branch of biology or medicine are eligible for fellowships which will be distributed among doctors of medicine and doctors of philosophy in the biologic sciences, bachelors of science and of arts who will receive training in health physics, and other suitably qualified scientific personnel.

Medical News

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

ARKANSAS

State Medical Election.—At the annual meeting of the Arkansas Medical Society in Little Rock, April 15-17, Dr. Pearlie W. Lutterloh, Jonesboro, was installed as president. Dr. Euclid M. Smith, Hot Springs, was chosen president elect, and Dr. William R. Brooksher, Fort Smith, was reelected secretary. The society voted to hold its 1949 convention in Hot Springs.

CALIFORNIA

International College of Surgeons.—The Southern California Chapter of the International College of Surgeons met May 10 at the University Club of Los Angeles. Papers presented were on the following topics: Dr. F.E. Cooper, "Surgery of Pancreatic Cysts," and Dr. J. Stein, "Malignant Tumors of the Breast."

Seven Year Grant for Research.--The Rockefeller Foundation has granted the California Institute of Technology, Pasadena, $100,000 annually for seven years for research in biology and chemistry as it relates to poliomyelitis and cancer. The institute's research in this field is concentrated on problems in molecular biology. The grant will be combined with others that will make possible a basic research program which, when fully established, will cost $250,000 a year.

Society News.--The California Society of Internal Medicine, meeting at the conclusion of the State Medical Association program April 13, elected Dr. Harold M. F. Behneman, San Francisco, president, and Dr. Donald A. Carson, San Francisco, secretary. The following physicians were elected to honorary membership: Thomas Addis, San Francisco; George Blumer, Pasadena; Robert N. Bramhall, Fair Oaks; Charles Miner Cooper, San Francisco; George Dock, Pasadena; Donald Jackson Frick, Los Angeles; Robert Langley Porter and Herbert C. Moffitt, San Francisco, and Ray Lyman Wilbur, Stanford University.

CONNECTICUT

Annual State Meeting.—Dr. Samuel C. Harvey, professor of surgery, Yale University School of Medicine, New Haven, assumed office as president of the Connecticut State Medical Society at the recent annual meeting. Dr. Charles H. Sprague, Bridgeport, was named president elect. Reelected were: Dr. Cole B. Gibson, Meriden, treasurer; Dr. Creighton Barker, New Haven, executive secretary, and Dr. Stanley B. Weld, Hartford, editor of the *Connecticut State Medical Journal*. Dr. Barker and Dr. Joseph H. Howard, Bridgeport, were named delegates to the American Medical Association, with Dr. W. Holbrook Lowell Jr., Hartford, and Dr. Oliver L. Stringfield, Stamford, as alternates. The meeting was attended by one thousand Connecticut physicians. At the banquet, the speakers were Connecticut's Governor James C. Shannon, and Dr. Edward L. Bortz, Philadelphia, President of the American Medical Association. During the meeting two organizations were formed: Connecticut Diabetes Association, with Dr. Barnett Greenhouse, New Haven, as president; and the Connecticut Physicians' Art Association, which held its first annual exhibit. The house of delegates voted to approve a prepaid medical care plan to be operated by a nonprofit organization of which a majority of the board of directors shall be physicians.

COLORADO

Psychosomatic Medicine for General Practitioners.—An orientation course in psychosomatic medicine, planned chiefly for the needs of the general practitioner, will be held at the University of Colorado School of Medicine, Denver, June 14-26, sponsored by the medical school, the Mental Hygiene Division, U. S. Public Health Service, and the Colorado State Department of Health. The course will comprise lectures at the beginning of each day followed by individual case studies in small groups; in the afternoons there will be group discussions of patients who have been examined. Dr. Harold G. Wolff, associate professor of medicine and psychiatry, Cornell University Medical College, New York, will be in attendance during the course. The program is under the direction of Dr. Franklin G. Ebaugh, professor of psychiatry, University of Colorado School of Medicine. Inquiries are to be addressed to Dr. Ebaugh. The number of candidates who may be accommodated is limited. There is no tution. A registration fee of $10 is required.

State Society and Press Adopt Code.--The Colorado State Medical Society has brought about the adoption of a code of cooperation between press and radio, hospitals and the medical profession. The medical society agrees to act as an information center or clearing house with twenty-four hour telephone service so its personnel can aid newsmen, and has named a publicity chairman for each of its twenty-six component district societies to be a spokesman for his local group. Hospitals have also named spokesmen. Lists of these representatives will be provided press and radio. Newspapers and radio agree to recognize the doctor-patient relationship and to respect the privacy and legal rights of patients, to strive for utmost accuracy in reporting medical news, and to exercise due editorial judgment in avoiding news which seeks solely to exploit the patient, physician or hospital. The code has been developed as a result of a meeting called last autumn by Dr. John S. Bouslog, Denver, president of the state society, which was attended by news, radio, hospital and medical leaders.

ILLINOIS

Mumps at the Peak.—The state health department announced May 13 that more cases of mumps had then developed this year in Illinois than during all of 1947. Of 6,729 cases in the state, more than 5,000 were reported in Cook County. The incidence showed no signs of declining, the report said.

Narcotic Violation.—The Bureau of Narcotics, Washington, D.C., reports that Dr. Jacob H. West, Champaign, pleaded guilty at Danville to an indictment charging violation of the federal narcotic law and on Oct. 11, 1947 was fined $100 and placed on probation for a period of three years.

Chicago

Personal.—Dr. Israel Davidsohn, Mount Sinai Hospital, Chicago, reported as consultant to the Army Institute of Pathology for the week beginning May 3.—Dr. Jacob P. Greenhill delivered the Samuel and Minnie Good-Friend Memorial Lecture May 3 at Lebanon Memorial Hospital on "Recent Advances in Obstetrics and Gynecology."

Rename Loyola Medical School.—The Loyola University School of Medicine has been renamed the Stritch School of Medicine in honor of Cardinal Stritch. The school is undertaking to raise $12,000,000, part of which is for the new building in the West Side Medical Center, which will house both the medical and dental schools.

Phi Rho Sigma Luncheon.—The Phi Rho Sigma Fraternity has reserved the Chicago Yacht Club, at the foot of Monroe Street, for its American Medical Association luncheon on Wednesday, June 23. Reservations have been made for one hundred and twenty-five persons. Members of the local committee in charge of this meeting are Drs. Robert M. Graham, Lawrence W. Peterson and Howard B. Carroll.

KENTUCKY

Refresher Courses.--The University of Louisville School of Medicine, in cooperation with the Kentucky State Medical Association, is offering refresher courses which will be conducted at the Louisville General Hospital, Louisville, June 1-12. These courses are open to returning medical officers and practicing physicians who are members of their respective state medical associations. Applications will be accepted in the order in which they are received. However, first preference will be given to physicians from Kentucky. Courses in medicine and surgery will be given June 1-5; gynecology and obstetrics, June 7-9 and pediatrics, June 10-12. Instruction will be in the form of lectures, clinics, ward rounds and conferences with emphasis on demonstrations in patients of recent advances in therapy. Instruction will be given from 9 a.m. to 12 noon and 1:30 to 4:30 p.m. A number of part time courses have been arranged. Information regarding fees and schedules may be secured from Dr. Herbert L. Cley, Director, Postgraduate Refresher Training, University of Louisville School of Medicine, 323 East Chestnut Street, Louisville 2.

LOUISIANA

Grants for Research.--The American Cancer Society has awarded grants for cancer research totaling $20,500 to Tulane University of Louisiana School of Medicine, New Orleans. About half of the grant is for the study of testosterone and mammary cancer for the period July 1,1948,until June 1,1949. by Dr. Champ Lyons, associate professor of surgery, and Dr. William Parson, instructor in medicine. The remainder of the grant will be used for research already under way on simultaneous electrophoresis and centrifugation effects in cancer by Robert T. Nieset, Ph. D., associate professor of biophysics, and Malcolm Randolph, of the college of arts and sciences. Bacitracin studies will be extended for another year under a grant of $15,222 from the office of the Surgeon General, U. S. Army. Drs. Alfred B. Longacre, Robert M. Waters and Dr. Florence L. Evans are collaborating in the research.

MISSISSIPPI

State Board of Health.--The following physicians have been appointed to the Mississippi State Board of Health for a period of six years, dating from January 1: Harvey F. Garrison Jr., Jackson; Hugh L. McKinnon, Hattiesburg, and Samuel E. Field, Centreville, the latter a reappointment.

Demonstrations in X-Ray Pelvimetry.—Dr. Frederick W. Goodrich, assistant in obstetrics and gynecology, Yale University School of Medicine, New Haven, Conn., arrived in Mississippi May 3 for a series of demonstrations in roentgen pelvimetry. He was accompanied by Dr. James H. Ferguson, Tulane University of Louisiana School of Medicine, New Orleans. The demonstrations were held as a part of the joint consultation program being done in thirty-three southern Mississippi counties by the university and the state board of health. Demonstrations were conducted at King's Daughters' Hospital, Brookhaven, Mississippi State Charity Hospital, Jackson, South Mississippi Charity Hospital, Laurel, and Forrest County Health Department, Hattiesburg.

MICHIGAN

Personal.—Dr. Mille E. Wilson, for forty-one years on the staff at the Lapeer State Home and Training School, retired April 30.

Health Statistics Conference.—A special conference on public health statistics sponsored by the University of Michigan School of Public Health in cooperation with the Association of State and Territorial Health Officers will be held at Ann Arbor, June 14-18. Four general subjects will be discussed: What Services and What Relationships Do We Need; Collecting and Processing Data; Utilization of Data, and Personnel Needs and Integration of Statistics into Administrative Practice. The course has been planned with the assistance of a committee of state and national authorities in public health. Those wishing to attend should address their requests to Henry F. Vaughan, D.P.H., Dean of the School of Public Health, University of Michigan, Ann Arbor.

MASSACHUSETTS

Expand Cancer Program.—Dr. Henry M. Lemon, a recent appointee to the staff at Boston University School of Medicine, has been appointed coordinator of the expanding cancer research and teaching program at the university. Dr. Lemon will direct the use of a $24,950 grant from the U.S. Public Health Service exclusively for cancer teaching and research. He has previously carried on research work at the University of Chicago Clinics under Dr. O. H. Robertson for the Commission on Air-Borne Infection.

Children's Cancer Foundation.—The Variety Club of New England Children's Cancer Research Foundation was organized March 30 by representatives of the Variety Club of New England and the Children's Hospital, Boston, with an initial fund of $45,536. John J. Dervin was chosen president and Dr. Sidney Farber, chairman of the hospital's division of laboratories and research, will direct the work of the foundation, with the heads of the departments of the Children's Hospital acting as a board of consultation. The Variety Club established the blood bank at the Children's Hospital in 1946 with an annual grant of $10,000. The club is a philanthropic organization of men in theatrical and show business.

MINNESOTA

University Medical Lectures.--Dr. Arthur Grollman, professor of experimental medicine at Southwestern Medical College, Dallas, Texas, gave the annual Duluth Clinic Lectures on May 11-12 at the University of Minnesota Medical School, Minneapolis. He spoke Tuesday at 8 p.m. on "Pathogenesis and Treatment of Hypertension" and Wednesday at 4 p.m. on "The Hypothalamus and Its Disorders." An informal seminar also was held on "The Interrelationship of the Endocrine Organs." David P. Lloyd, Ph. D., of the Rockefeller Institute for Medical Research, will give the annual J. B. Johnston lecture in the Medical Sciences Amphitheater at 8 p.m. May 19, on "Monosynaptic Reflexes and the Myostatic Unit." He will also lecture at the Center for Continuation Study on May 20. The Johnston lectureship was established in 1944 in honor of John Black Johnston, former professor of comparative neurology.

NEW HAMPSHIRE

Annual Meeting of State Society.—The New Hampshire Medical Society will hold its annual meeting at the Hotel Wentworth, New Castle, June 2-3, under the presidency of Dr. John A. Hunter, Dover. The program is made up of round table conferences in the mornings and general meetings in the afternoons. Guest speakers include:

Henry C. Marble, Boston, Compound Injuries of the Hand.
Howard B. Sprague, Boston, Conditions Mistaken for Angina Pectoris and Coronary Thrombosis.
Gerald H. Pratt, New York, Surgical Management of Complications of Diabetes Mellitus.
Grantley W. Taylor, Boston, Carcinoma of the Buccal Cavity.

Drs. Henry W. Hudson Jr., Brookline, Mass., and J. Dellinger Barney, Boston, will take part in the conferences. The banquet will be at 7 p.m. Thursday.

NEW YORK

Rochester Academy Awards.—At a meeting of the Rochester Academy of Medicine, May 4, Dr. Paul W. Beaven, received the Paine Drug prize of $100 for his essay, "An Analysis of Tuberculosis Infection," and Dr. Stuart W. McLeod received the Mead Johnson prize of $100 for his essay on "Barbiturate Poisoning." The Council of Rochester Regional Hospitals' $100 prize for nurses was awarded to Miss Helen M. Yarosz for her essay on "Comprehensive Nursing Care," and Dr. Barbara Ann Wood was presented the John W. MacCauley $25 prize for a paper on "Adrenal Cortical Insufficiency in the Newborn."

Examinations of Boxers and Wrestlers.—The governor has approved a law creating a medical advisory board for the State Athletic Commission. The board, to consist of nine members appointed by the governor, will prepare regulations for the physical examination of professional boxers and wrestlers, recommend qualified physicians to conduct examinations required and the fees to be paid therefor and act in an advisory capacity to the commission. A physician designated by the commission shall be present at every boxing or sparring match or exhibition at the expense of the promoter.

New York City

Research on Alcoholism.—The Research Council on Problems of Alcohol has granted $30,000 to Cornell University Medical College to continue research into the causes and treatment of alcoholism. The grant is the second installment of the five year $159,000 project at the New York Hospital-Cornell Medical Center under the direction of Dr. Oskar Diethelm. The council has also granted $20,000 to the New York University College of Medicine for a study on biochemical and endocrinologic factors in alcoholism. The grant is the second this spring from the Research Council to the college.

University Appointments.—Dr. Harold W. Brown has been appointed acting director of Columbia University's School of Public Health during the absense of Dr. Harry S. Mustard, who is on leave serving as Commissioner of Health of New York City. Dr. Brown, who has been professor of parasitology at Columbia since 1943, received his doctor of science degree at Johns Hopkins, his medical degree at Vanderbilt University School of Medicine, Nashville, Tenn., and a degree of doctor of public health at Harvard University, Boston. During the war he worked with the Navy on new drugs for the treatment of tropical disease and was consultant to the Secretary of War. Dr. Cushman D. Haagensen, associate professor of surgery, has been appointed coordinator of cancer teaching in the College of Physicians and Surgeons of Columbia University. The coordination project was made possible by a grant of $23,976 from the U. S. Public Health Service. Dr. Haagensen is a graduate of Harvard Medical School. He is also assistant attending surgeon and assistant surgical pathologist to the Presbyterian Hospital.

NORTH CAROLINA

University News.—Dr. Angus Crawford Randolph has joined the staff of the department of neuropsychiatry at Bowman Gray School of Medicine, Winston-Salem, as senior resident in psychiatry at Graylyn, the school's rehabilitation and rest center. Dr. Randolph is a graduate of Princeton University and the University of Virginia Department of Medicine, Charlottesville, Va., and is a veteran of the army air force medical corps.

Recent grants made to the Bowman Gray School of Medicine include one of $1,000 from the executive committee of the North Carolina division of the American Cancer Society, Inc., to pay for a refresher course in cancer for state physicians; two grants totaling $31,300 came from the National Cancer Institute of the U.S. Public Health Service to aid in cancer teaching under the direction of Dr. Robert P. Morehead, head of the department of pathology. A grant of $5,950 was made by the National Advisory Health Council for study of the formation of phospholipids by the liver in cirrhosis of the liver. Radioactive materials from the atomic pile are being used in this study.

OKLAHOMA

Postgraduate Courses.—The summer session of the Postgraduate Medical Course for Resident Physicians and Interns at Hillcrest Memorial Hospital, Tulsa, began May 3 and will extend through August with one lecture each day, Monday through Friday, at 6 p.m. with the exception of the Clinical Pathological Conference, which starts at 7 p.m. Although this course is primarily for the house staff, any doctor who is a member of his local county society is urged to attend at any time. There is no fee. The fall session will begin in September.

PENNSYLVANIA

Councilor District Annual Meetings.—Four Councilor Districts of the Medical Society of the State of Pennsylvania will hold annual meetings early in June. The Second Councilor District will meet at the Golf and Country Club, West Chester, June 2 beginning at 12:30 p.m. The speakers will be Chauncey L. Palmer, Pittsburgh, "Pending Health Legislation," and Paul N. Jepson, Philadelphia, "Treatment of Painful Shoulder."

The Eleventh Councilor District will meet at the Country Club, Uniontown, June 2 at 10 a.m. The program is as follows:

Paul Stamas, Uniontown, Characteristics of the Allergic Child.
Othello S. Keagh, Uniontown, Cancer of the Lung.
Leroy C. Waggoner, Brownsville, Practical Considerations of the Connective Tissue.
L. Dale Johnson, Connellsville, Office Treatment of Diabetes Mellitus.
William H. Hesse, Uniontown, Female Sterility.
Floyd H. Bragdon, Pittsburgh, Neurosurgical Problems in General Practice.
Frank J. Gregg, Pittsburgh, Physiologic Principals in Management of Heart Failure.

On June 3 the Fifth Councilor District will meet at the West Shore Country Club, Camp Hill, near Harrisburg, at 10 a.m. Those present will hear: Pascal F. Lucchesi, Philadelphia, "Shifting Role of Preventive Medicine;" Louis B. LaPlace, Philadelphia, "Chronic Illness"; William Dunbar, Philadelphia, "Rehabilitation of the Chronically Ill"; Mr. Lester H. Perry, Harrisburg, "Public Relations," and Chauncey L. Palmer, Pittsburgh, "Pending Health Legislation."

The Sixth Councilor District will meet at the Green Gables Hotel, Lewistown, June 9 at 12 noon. Speakers will be:

Chauncey L. Palmer, Pittsburgh, Pending Health Legislation.

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Mr. Lester H. Perry, Harrisburg, Improving Public Relations.
Thomas M. Durant, Philadelphia, Treatment of Congestive Failure.
Louis B. LaPlace, Philadelphia, Problems of Geriatrics.

SOUTH DAKOTA

Annual State Medical Meeting. -- The South Dakota State Medical Association will hold its annual meeting in the Coliseum, Sioux Falls, May 30 to June 1, under the presidency of Dr. H. Russell Brown, Watertown. Guest speakers will be:
Harvie H. Petersen, Chicago, The National Physicians Committee.
Harry M. Weber, Rochester, Minn., Early Diagnosis of Intestinal Neoplasm.
Jay A. Myers, Minneapolis, Minn., Eradication of Tuberculosis -- Your Responsibility.
Emil D. W. Hauser, Chicago, Orthopedic Care of Polio Patients.
Henry L. Williams, Rochester, Minn., Classification and Treatment of Common Types of Headache.
Donald D. Hastings, Minneapolis, Minn., Psychosomatic Aspects of the Gastrointestinal Tract.
Albert W. Diddle, Dallas, Texas, Noninvasive Cervical Cancer.
Nathaniel G. Alcock, Iowa City, Iowa, Tumors of the Adult Kidney.
Walter L. Bierring, Des Moines, Iowa, Public Health and the Practicing Physician.
Walter A. Fansler, Minneapolis, Minn., Polyps of the Colon and Rectum.
Charles H. Slocumb, Rochester, Minn., Vitamin Toxicity.
Max M. Peet, Ann Arbor, Mich., Splanchnicectomy in Treatment of Hypertension.
L. Fernald Foster, Bay City, Mich., Medical Economics in a World of Change.
Francis W. Lynch, St. Paul, Minn., Treatment of Common Dermatoses.
Carroll E. Roach, Indianapolis, Ind., Developments in Active Immunization.
A. Graham Asher, Kansas City, Mo., Advances in Cardiology.

The annual banquet will be at the Cataract Hotel, May 31, with Dr. Morris Fishbein, Editor of THE JOURNAL, speaking on "A Century of Medical Progress." The Woman's Auxiliary and the South Dakota Academy of Ophthalmology and Otolaryngology will meet in conjunction with the state society.

TEXAS

Hardin Memorial Fund. — A Southwestern Medical Foundation memorial fund, in honor of the late Dr. Hal W. Hardin, Dallas, has been established by Dallas naval reserve officer friends of the physician and other friends. Dr. Hardin, who died Dec. 29, 1947, was clinical instructor in ophthalmology at Southwestern Medical College and staff member of Baylor Hospital.

Institute of Alcohol Studies.—The Yale Institute of Alcohol Studies in the Southwest was formally inaugurated at a two day celebration in Fort Worth May 14-15. Yale University is establishing a long range research and clinical center in cooperation with Texas Christian University, Fort Worth. At the inaugural dinner in public health activities, representatives of state and county medical societies, the presidents of Texas universities and of the state universities of New Mexico, Oklahoma and Arkansas were present. The Yale Institute of Alcohol Studies in the Southwest will comprise the following activities: (1) research unit in the social sciences at Texas Christian University, (2) clinic for the rehabilitation of alcoholic persons at Dallas, (3) summer school of alcohol studies at Trinity University, San Antonio and (4) informal educational activities at all levels throughout the state. Administration of the institute will be centered at the Yale Laboratory of Applied Physiology to assure tested experience and expertness in the field. Dr. Howard W. Haggard and Elvin M. Jellinek, Sc.D., New Haven, Conn., director of the institute and a Texas advisory board will determine the broad policies of the institute.

GENERAL

Postgraduate Committees Luncheon.—The Associated States Postgraduate Committees will have a luncheon meeting June 23 at the Palmer House, Chicago.

Receives Richards Medal.--Edwin J. Cohn, Ph. D., chairman of the department of physical chemistry, Harvard Medical School, Boston, was awarded the 1948 Theodore William Richards Medal of the northeastern section of the American Chemical Society, May 13. Dr. Cohn is known for his work in combating disease and shock through research in the chemistry of the blood.

Society for the Study of Sterility.--The annual national conference of the American Society for the Study of Sterility will be held at the Congress Hotel, Chicago, June 21-22. Invited speakers include: Drs. Charles B. Huggins, Chicago, Melvin R. Cohen, Chicago, Ira I. Kaplan, New York, Dr. M. James Whitelaw, Phoenix, Ariz., and Dr. Oscar Schneller, Philadelphia. The registration fee is $5.

Dr. Hamilton Receives Van Meter Prize Award. — Dr. C. Ferrill Hamilton, Rochester, Minn., fellow in medicine, was given the Van Meter Prize Award of the American Association for the Study of Goiter at a meeting in Toronto, May 6 - 8. The award was offered for the best essay on original work on problems related to the thyroid gland. Dr. Hamilton's paper is entitled "Radioiodocasein: Its Action, Fate and Distribution in the Human."

Annual Meeting of Neurologists.--The American Neurological Association will hold its annual meeting June 14-16 at the Hotel Claridge, Atlantic City, N. J., under the presidency of Dr. George Wilson, Philadelphia. Guest speakers from the European continent include: Birger Kaada, Arne Torkildsen, and Kristian Kristiansen of Oslo, Sweden. In addition, numerous papers will be presented by members of the association.

Polio Emergency Volunteers Handbook.--The National Foundation for Infantile Paralysis has prepared the 1948 Polio Emergency Volunteers Handbook, which is ready for distribution. It explains how a chapter initiates and carries out the emergency program in both rural and urban areas. About 10,000 Polio Emergency Volunteers have been trained by the National Foundation in a project experimental three years ago but now of proved worth. Copies may be obtained free of charge by writing the foundation at 120 Broadway, New York 5.

New Director of Cancer Society.--Dr. Charles S. Cameron, New York, associated with the American Cancer Society, Inc., since 1946, was appointed medical and scientific director at a board meeting in Chicago in February. He has served in the various capacities of assistant, acting and associate medical and scientific director, as well as director, of the service department. He is also a consultant in cancer control to the U.S. Public Health Service and is clinical assistant surgeon at Memorial Hospital, New York

Urology Prize Essay Fund.—The Southeastern Section of the American Urological Association announces receipt of a $1,000 donation from Mr. and Mrs. William R. McEwen, Fort Lauderdale, Fla. The fund is to be used to stimulate research on the problem of "Urinary Bladder Dysfunction." An award of $250 will be made for the best essay presented before the annual meeting of the Southeastern Section. Competition is open to physicians who have graduated from medical school within the past ten years. Information may be obtained from Dr. Russell B. Carson, 409 Sweet Building, Fort Lauderdale, Fla., who is secretary-treasurer, Southeastern Section, American Urological Association.

Grants for Pharmaceutical Research.—The Purdue Research Foundation has received $2,500 from Pitman-Moore Company, Division of Allied Laboratories, Inc., for the purpose of developing and improving medicinal products. The investigations under this project will be directed by Glenn L. Jenkins, Ph.D., dean of the Purdue University School of Pharmacy, Lafayette, Ind. Another grant of $2,000 was made by the company to the Committee for the Promotion of Medical Research, Inc., New York. Dr. Robert C. Batterman will supervise the work under this grant.

Conference of State Associations Officers.--The annual Conference of Presidents and other Officers of State Medical Associations will meet at the Sheraton Hotel, Chicago, June 20, 12:30-5:00 p.m., under the presidency of Dr. L. Howard Schriver, Cincinnati. The group will be addressed by:

Joseph H. Howard, Bridgeport, Conn., Despotism by Consent of the Governed.

Paul R. Hawley, Washington, D.C., The Blue Shield-Blue Cross Program.

John W. Cline, San Francisco, Why a State Medical Association?

International Congresses.--The International Federation of Sport-Medicine has announced its general assembly will be held June 29 in Prague, Czechoslovakia. The Seventh International Medical Congress of Physical Education will be held July 1-5 in connection with the XI Sokol Festival, Prague. At the conclusion of the congress, trips through Czechoslovakia will be organized for the members. The application fee of KCS 400 allows for the railway reduction for the participation at the Sokol festival and for the congress publication. Applications from abroad should be sent to Prof. MUDr. Jiri Kral, Praha II. Vladislovova 15, Czechoslovakia.

Esmond Long to Edit Tuberculosis Journal.--Dr. Esmond R. Long, Philadelphia, director of medical research and therapy, National Tuberculosis Association, has been named editor in chief of the *American Review of Tuberculosis*, to succeed the late Dr. Max Pinner. A new position of managing editor has been created and Dr. Walsh McDermott, associate professor of medicine, Cornell University Medical School, New York, has been appointed. Editorial offices of the publication are being returned to New York from Oakland, Calif., where they were transferred in 1946. Dr. Long, who is also director of the Henry Phipps Institute, Philadelphia, has been director of the National Tuberculosis Association's medical research since January 1947. He is a past president of the National Tuberculosis Association and is a consultant to the United States Army, the Veterans Administration and the U.S. Public Health Service.

Interamerican Cardiological Congress.—The Third Interamerican Cardiological Congress will be held at Michael Reese Hospital, Chicago, June 13-17.

Visiting chairmen of the scientific sessions include: John Hepburn, Toronto, Canada; Hernan Alessandri, Santiago, Chile; Luis Ortega Verdes, Havana, Cuba; Cecil C. Birchard, Montreal, Canada; Salvador Aceves and Teofilo Ortiz Ramirez, Mexico, D.F., Mexico; Roberto Vedoya, Buenos Aires, Argentina; Augustin Castellanos y Gonzales, Havana, Cuba; Ignazio Chavez, Mexico, D.F., Mexico; Pedro Cossio, Buenos Aires, Argentina; Arturo Rosenblueth, Mexico, D.F., Mexico; Rafael M. Alzamora, Lima, Peru; Ramon M. Aixala, Havana, Cuba, and Gustav Nylin, Stockholm, Sweden. Among individuals from various nations who will present papers are: Mohamed B. Kenawy, Cairo, Egypt; Gustav Nylin, Stockholm, Sweden; Nicandro Chavez, Mexico, D.F., Mexico; Imre Zarday, Budapest, Hungary; Johannes Barthomeus Kleyn, Hague, Netherlands; Pierre Rijlant, Brussels, Belgium; Kenneth I. Melville, Montreal, Canada; Max Winternitz, Trutnov, Czechoslovakia, and Albert A.F. Peel, Glasgow, Scotland.

A banquet for official delegates and foreign members and guests of the congress will be given June 14 at the Stevens Hotel. On Tuesday evening, delegates, foreign members and guests of the congress will be entertained at a banquet at the Stevens Hotel by the American representatives of the first and second congresses. On Wednesday from 9 to 12 p.m. the directors of Michael Reese Hospital will hold a reception at the Drake Hotel.

CORRECTIONS

Polymyxin.--In the article on "Polymyxin" in THE JOURNAL, April 24, on page 1097 the LD 50 in mice should have been stated at 250 to 300 mg. per kilogram instead of 50 to 300 mg.

Charles H. Scheifley.--The foregoing is the correct spelling of this author's name, and he is with the Division of Medicine, Mayo Clinic, Rochester, Minn., rather than with the Division of Medicine, Northwestern University Medical School, Chicago, as was indicated in THE JOURNAL, March 20, page 819.

Appointments and Promotions.--Dr. Isidor C. Rubin, lately appointed clinical professor in the department of obstetrics and gynecology, New York University College of Medicine, is located in New York City, not Hempstead, N. Y., as stated in THE JOURNAL, April 17, page 1057.

Residency Training Program.--Data regarding the approved residency training program in orthopedic surgery at the Cincinnati General Hospital, Cincinnati, published in THE JOURNAL May 1, page 64, are revised as follows: chief of service, Dr. Joseph A. Freiberg; inpatients treated, 250; number of outpatient visits, 7,048; deaths on service, 3; number of autopsies, 1; assistant residents, 2; residents, 1; service begins, July 1; length of service, one to two years; minimum stipend per month, $25.

Marriages

GEORGE OTTO FRENCH, San Luis Obispo, Calif., to Miss Marion Blascoe of Brooklyn, January 25.

MORRIS J. FINER, Denver, to Miss Helen Pilaszewski of Cicero, Ill., February 7.

HERBERT CAILLE MAIER to JANET STERLING BALDWIN, both of New York, January 10.

SAMUEL LOGAN, New Orleans, to Miss Margot Bennett of Atlanta, recently.

JAMES BLACKMAN HAVRON, South Pittsburg, Tenn., to Miss Carolyn Elizabeth Morgan in Chattanooga, January 10.

JOHN McMAHAN DAVIS, Columbia, S. C., to Miss Mary Burke in Alcolu, January 16.

ROBERT LUCIUS TORNELLO, Youngstown, Ohio, to Miss Jean DeEtte Pullam of Canfield, January 10.

PAUL BERNHARDT TUMS, Salisbury, N. C., to Miss Mabel Bassett Hooker in Martinsville, Va., Dec. 6, 1947.

CARL A BERNTSEN JR., San Francisco, to Miss Anne Proctor Rice in Hamilton, Mass., January 10.

ALBERT G. KING JR. to Miss Nancy Deen, both of Lakeland, Fla., in Philadelphia Dec. 3, 1947.

CUSTIS LANSING COLEMAN, Richmond, Va., to Miss Janet Shaw McGeachy Fisher of St. Pauls, N. C., January 10.

JEROME D. FRANK to Miss Elizabeth Morris Kleeman, both of New York, January 4.

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Deaths

Rupert Lee Blue ● Medical Director, U. S. Public Health Service, retired, died in the Roper Hospital at Charleston, S.C., April 12, aged 79, of arteriosclerotic heart disease. Born in North Carolina on May 30, 1868, Dr. Blue received his medical degree from the University of Maryland School of Medicine, Baltimore, in 1892. Immediately thereafter he entered the U. S. Public Health Service as intern, becoming assistant surgeon in 1893, passed assistant surgeon in 1897, surgeon in 1909 and surgeon general from 1912 to 1920. During this time he was stationed at Baltimore, Galveston, Texas, Charleston, S.C., San Francisco, Portland, Ore., Milwaukee, New York, Norfolk, Va., and New Orleans, having been assigned to hospital, quarantine and other public health duties.

Dr. Blue was sent to Italy by President McKinley when cholera threatened our shores in 1900. In 1905 he was second in command of measures taken in New Orleans to eradicate yellow fever. In 1903 and again in 1907 he was placed in charge of plague-eradicative measures in California, where he advanced the idea that rat-proofing is essential to prevent plague in urban communities. As director of sanitation of the Jamestown exposition in 1907, Dr. Blue reduced mosquito-breeding areas to prevent malaria. This experience was later responsible for his special study of tropical diseases at the London School of Tropical Medicine. Then he became adviser to the governor of Hawaii with the object of guarding against the introduction of yellow fever and malaria after the opening of the Panama Canal. It was from this duty that he was called to become Surgeon General. He directed investigations of leprosy which led to the establishment of the federal institution at Carville, La. Under his administration the Public Health Service also inaugurated venereal disease prevention and control work in cooperation with the states. During World War I he was chief of the Federal Health Service, which, with the Red Cross and state boards of health, set up sanitary safeguards in military camps. In May 1928 he served on a board in Washington, D.C., to revise the quarantine regulations, to prevent international transmission of disease by airplane travelers.

Dr. Blue was president of the American Medical Association in 1915, served as president of the Association of Military Surgeons of the United States from 1915 to 1917, was an honorary fellow of the American College of Surgeons and held membership in many other scientific societies. In 1910 he represented the Public Health and Marine Hospital service at the International Medical Congress at Buenos Aires. During a trip to Europe in 1920 he directed efforts to prevent the spread of disease to this country whereby immigrants were examined by officers in twenty-nine European ports. He was a delegate to the International Office on Public Hygiene in Paris, from 1920 to 1923, to the third Decennial Revision of the International Nomenclature of Diseases, adviser to U. S. Mission Lausanne Peace Conference, 1922-1923, and American delegate to the Opium Conference, League of Nations, in Geneva, Switzerland, in 1923. He received honorary degrees from the universities of Maryland, Wisconsin and Michigan. The president of France bestowed on him the insignia of a Chevalier of the Legion of Honor. He retired from the U. S. Public Health Service in 1932.

Reid Hunt, Boston, professor of pharmacology emeritus at Harvard Medical School, died March 10, aged 77, of pneumonia. Dr. Hunt was born in Martinsville, Ohio, April 20, 1870. Following studies at Wilmington College and Ohio University he studied in Germany, then returned to Baltimore, where he received his M.D. degree from the College of Physicians and Surgeons in 1896. After serving as tutor in physiology at Columbia University College of Physicians and Surgeons in New York from 1896 to 1898, he was on the staff of Johns Hopkins University School of Medicine in Baltimore until 1903, first as associate and then as associate professor of pharmacology. From 1902 to 1904 he worked in Ehrlich's Laboratory in Frankfort, Germany, then returned to the United States to take the position of chief of the pharmacologic division in the hygienic laboratory of the U.S. Public Health Service. In 1913 he went to Harvard as professor of pharmacology, becoming professor emeritus in 1936. In 1923 he was visiting professor to Peking-Union Medical College and from 1920 to 1930 president of the United States Pharmacopoeial Convention. He was chairman of the Section on Pharmacology and Therapeutics of the American Medical Association from 1908 to 1909 and a member of the House of Delegates in 1911 and 1912. In 1906 he was appointed a member of the Council on Pharmacy and Chemistry of the Association; he served until 1924, when he was appointed vice chairman, and was chairman from 1927 to 1936, when he resigned. Dr. Hunt was a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the Association of American Physicians, the Leopold-Carol Akademie, the Deutsche Pharmkologie Gesellschafft, the American Physiological Society and the American Society for Pharmacology and Experimental Therapeutics, of which he had been first secretary and the third president. He was chairman of the Northeastern Section of the American Chemical Society and consultant pharmacologist to the Massachusetts Board of Health and to the Chemical Warfare Service of the U.S. Army. He was a member of the permanent standards commission of the League of Nations. Dr. Hunt was at one time a member of the editorial board of the *New England Journal of Medicine* and contributed much to the literature on his speciality.

Abraham Arden Brill ● New York, noted psychiatrist, died at Mount Sinai Hospital March 2, aged 73, of coronary thrombosis Dr. Brill was born in Austria Oct. 12, 1874, was graduated from New York University in 1901 and received his M.D. degree from Columbia University College of Physicians and Surgeons, New York, in 1903. After four years as an assistant physician at the Central Islip (N.Y.) State Hospital he went abroad and studied in Paris, Zurich and Vienna. Returning to the United States, he became chief of the clinic in psychiatry at Columbia University, a post he held from 1911 to 1912. During World War I he was a major in the medical reserve corps of the U.S. Army. Dr. Brill, a specialist certified by the American Board of Psychiatry and Neurology, had been lecturer on psychoanalysis and abnormal psychology at New York University and an assistant professor of psychiatry at the New York Post-Graduate Medical School. At the time of his death he was clinical professor of psychiatry at the New York University College of Medicine and lecturer on psychoanalysis and psychosexual sciences at Columbia University. He was a member of the New York Neurological Society; American Psychopathological Association; American Psychoanalytic Association, of which he was past president; New York Psychoanalytic Society, of which he was honorary president; New York Academy of Medicine; American Psychiatric Association;

Association for Research in Nervous and Mental Diseases; American Association for the Advancement of Science, and the Anthropological Ethnology Society. In 1943 Dr. Brill delivered the Salmon Lectures on psychiatry and mental hygiene at the New York Academy of Medicine. He was consultant at the Manhattan State Hospital and the Veterans Administration Hospital. Among his numerous works were translations into English for the first time of the writings of Freud, including "Psychoanalysis—Its Theories and Practical Application," "Fundamental Conceptions of Psychoanalysis," "Freud's Selected Papers on Hysteria," "Three Contributions to the Theory of Sex," "Freud's Interpretations of Dreams" and "Psychopathology of Everyday Life."

J. Bentley Squier ✠ New York, professor emeritus of urology at Columbia University College of Physicians and Surgeons, died March 1, aged 74, of coronary thrombosis. Dr. Squier was born in New York Nov. 6, 1873. After graduating from Columbia University College of Physicians and Surgeons, New York, in 1894, he interned at St. Luke's Hospital, then for twelve years was attending surgeon for the City Department of Charities. He was appointed professor of genitourinary surgery at the New York Post-Graduate Medical School in 1909, serving until 1924, and was professor of urology at Columbia University from 1917 until 1939, when he became emeritus professor. In 1917 he aided in forming the staff of the United States Army General Hospital number 1, and during World War I served as a major in the medical reserve corps and as a member of the General Medical Board of the Council of National Defense. A specialist certified by the Board of Urology, Dr. Squier was a member and past president of the American Urological Association, American Association of Genito-Urinary Surgeons and the Medical Society of the County of New York. He was a member of L'Association Internationale d'Urologie and of the Clinical Society of Genito-Urinary Surgeons. Dr. Squier was one of the founders of the American College of Surgeons, of which he was a life member, governor, regent and past president. The Squier Urological Clinic, which he organized and served as director, was established by friends and former patients as a tribute to him at the Columbia-Presbyterian Medical Center. He was consulting surgeon at St. Luke's Hospital and consulting urologist to Roosevelt Hospital and the Neurological Institute. In 1925 he received the Doctor of Laws degree from the University of Pittsburgh and in 1938 was made a Commander of the Order of the North Star by King Gustav V of Sweden.

James Taylor Harrington ✠ Poughkeepsie, N.Y.; born in New York May 7, 1877; Columbia University College of Physicians and Surgeons, New York, 1906; past president of the Poughkeepsie Academy of Medicine and the Dutchess County Medical Society; formerly member of the board of health and a director of the Dutchess County Health Association; member of the founders group of the American College of Surgery; fellow of the American College of Surgeons; served during World War I; attending surgeon at the Vassar Brothers Hospital, where he served as superintendent and chief surgeon; formerly director of the Poughkeepsie Chamber of Commerce, Y.M.C.A. and the Fallkill National Bank; died February 27, aged 70.

Leland Eggleston Cofer ✠ Surgeon, U.S. Public Health Service, retired, Palm Beach, Fla.; born in Richmond, Va., in 1869; Medical College of Virginia, Richmond, 1889; entered the U.S. Public Health Service in 1890; later placed in charge of the Marine Hospital, Quarantine and Immigration Medical Affairs, in the Hawaiian Islands; served for two terms as assistant surgeon of the United States; at various times a member of the board of health of the city of New York, health officer of the Port of New York and director of the division of industrial hygiene of the New York State Department of Labor; formerly member of the Public Health Committee of the New York Academy of Medicine; died February 17, aged 78, of coronary sclerosis.

Joseph Spragg Evans ✠ Madison, Wis.; born in West Chester, Pa., March 6, 1875; University of Pennsylvania Department of Medicine, Philadelphia, 1899; emeritus professor of Medicine at the University of Wisconsin Medical School, where he was the first professor of medicine and chairman of the department; at one time instructor in clinical medicine at his alma mater and associate at the William Pepper Laboratory of Clinical Medicine in Philadelphia; fellow of the American College of Physicians; honorary member of the Wisconsin Hospital Association; specialist certified by the American Board of Internal Medicine; affiliated with the State of Wisconsin General Hospital, where he died February 3, aged 72, of arteriosclerosis.

Ernest Frederick Krug ✠ New York; born in Cleveland Oct. 27, 1877; Columbia University College of Physicians and Surgeons, New York, 1900; formerly associate professor of ophthalmology at the New York Post-Graduate Medical School and Hospital, Columbia University; specialist certified by the American Board of ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology and the American Ophthalmological Society; served during World War I; consulting ophthalmologist and past president, medical board, Lenox Hill Hospital; affiliated with the New York Post Graduate Hospital; died February 28, aged 70, of a cerebral accident.

Charles Alexander Bailey, Jackson, Miss.; Long Island College Hospital, Brooklyn, 1896; hospital consultant with the Mississippi Commission on Hospital Care; for many years affiliated with the International Health Board of the Rockefeller Foundation, serving in Europe and Latin America; recipient of many awards in this country, Mexico and abroad; at one time health officer of Yazoo County; died February 4, aged 71, of coronary thrombosis.

John Alfred Barton, Fitchburg, Mass.; Harvard Medical School, Boston, 1897; member of the American Medical Association and of the New England Otological and Laryngological Society; affiliated with Burbank Hospital, where he died February 26, aged 73, of Parkinson's disease and uremia.

Charles Coffing Beach ✠ Hartford, Conn.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1892; past president of Hartford Medical Society; formerly medical director of the Travelers Insurance Company; for many years on the staffs of the Hartford, St. Francis, Mount Sinai and McCook Memorial hospitals; at one time police surgeon; member of the American Museum of Natural History and the Zoological Society of New York; died February 11, aged 91, of coronary disease.

Theodore Bruce Beatty, Ross, Calif.; Rush Medical College, Chicago, 1884; member of the American Medical Association and the Utah State Medical Association; past president of the Conference of State and Provincial Health Authorities of North America; health commissioner of Utah from the time the state department of health was created in 1899 until he retired on July 3, 1935; served as secretary of the state board of health; formerly affiliated with the U.S. Public Health Service; died February 12, aged 94.

Robert Gale Boyd ● Spokane, Wash.; University of Nebraska College of Medicine, Omaha, 1930; past president and secretary of the Spokane County Medical Society; fellow of the American College of Surgeons; specialist certified by the American Board of Surgery; affiliated with Sacred Heart, Deaconess and St. Luke's hospitals; died in Berkeley, Calif., February 18, aged 43, of cerebral thrombosis.

William Augustus Boyd ● New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1895; first vice president of the Bronx County Medical Society when it was chartered; one of the organizers of the Bronx Medical Association, serving as its president in 1910 and later as treasurer; affiliated with the Lincoln Hospital and the Union Hospital, where he died February 20, aged 75, of chronic myocardial disease.

Emery G. Bounell, Hillsboro, Ind.; Medical College of Indiana, Indianapolis, 1895; member of the American Medical Association; served during World War I; on the staff of Culver Hospital, Crawfordsville; president of Hillsboro State Bank and Hillsboro Building and Loan Association; died in St. Elizabeth Hospital, Danville, Ill., February 20, aged 76, as the result of a fall.

Alfred Ernest Braden, Everett, Wash.; Medico-Chirurgical College of Kansas City, Mo., 1905; died in King County Hospital, Seattle, January 21, aged 72, of injuries received in an automobile accident.

Orvis Adoniram Brenenstuhl ● Albany, N.Y.; Albany Medical College, 1913; county coroner's physician for many years; on the staff of the Memorial Hospital; died February 14, aged 59.

Alfred James Bryant, Marshalltown, Iowa; Starling Medical College, Columbus, 1896; affiliated with Decatur County Hospital in Leon; died February 24, aged 78.

Michael Canich ● Brooklyn; Long Island College Hospital, Brooklyn, 1914; served on the staffs of the New York Post-Graduate Medical School and Hospital in New York, Beth El Hospital, Brooklyn Hebrew Home and Hospital for Aged and East New York Dispensary; consulting proctologist at the Brooklyn Womens Hospital; died February 14, aged 60, of coronary occlusion.

Joseph Caplan, Baltimore; University of Virginia Department of Medicine, Charlottesville, 1925; member of the American Medical Association; served during World War I; died February 7, aged 48, of duodenal ulcer and hypernephroma.

James Calowny Carr, Middlesboro, Ky.; Lincoln Memorial University Medical Department, Knoxville, Tenn., 1912; served during World War I; died February 3, aged 60, of hypertensive heart disease.

Francis Patrick Carroll ● Bridgeport, Conn.; Johns Hopkins University School of Medicine, Baltimore, 1914; for six years city physician; past president of the Bridgeport Medical Association; served on the staff of St. Vincent's Hospital, where he died January 2, aged 64, of arteriosclerotic heart disease.

Harvie De Jarnette Coghill ● Richmond, Va.; Medical College of Virginia, Richmond, 1924; assistant professor of pediatrics and neuropsychiatry at his alma mater; member of the American Psychiatric Association and the American Orthopsychiatric Association; director of the Memorial Guidance Clinic; died February 6, aged 63, of pneumonia.

John Henry Collins ● Schenectady, N.Y.; University of Vermont College of Medicine, Burlington, 1897; formerly city health commissioner; served on the staff of Ellis Hospital; member of the board of directors and formerly on the staff of the Sunny View Home for Crippled Children; died January 25, aged 78.

Ezra Lincoln Covey, Honor, Mich.; Grand Rapids Medical College, 1899; University of Michigan Homeopathic Medical School, Ann Arbor, 1907; died February 1, aged 74.

Foster Julius Curtis, Salt Lake City; Hahnemann Medical College and Hospital, Chicago, 1905; member of the American Medical Association; served during World War I; commanding officer of the Veterans Administration Hospital; died February 3, aged 66, of cerebral hemorrhage.

Louis Henry Dyke Jr., ● Berkeley, Calif.; University of Southern California School of Medicine, Los Angeles, 1937; specialist certified by the American Board of Pathology, Inc.; member of the American Society of Clinical Pathologists; commander in the medical corps of the U. S. Naval Reserve during World War II; served as president of the California Pathological Society and as secretary of the San Francisco Pathological Society; died February 3, aged 38, of coronary thrombosis.

Thomas Perrine Edmundson, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1912; for many years affiliated with the Shadyside Hospital; died in Tarpon Springs, Fla., February 2, aged 56, of coronary thrombosis.

Calvin H. English ● Fort Wayne, Ind.; Fort Wayne College of Medicine, 1884; formerly chief medical director of the Lincoln National Life Insurance Company; veteran of the Spanish-American War; served on the staffs of Hope and Lutheran Hospitals; died February 4, aged 90, of pneumonia.

Thomas Alphous Evans, Columbus, Ohio; Rush Medical College, Chicago, 1899; veteran of the Spanish-American War and World War I; served on the staff of the U. S. Veterans Bureau; died in St. Anthony's Hospital February 3, aged 76, following an operation.

Julian Vincent Flaig, Philadelphia; Jefferson Medical College of Philadelphia, 1932; certified by the National Board of Medical Examiners; served during World War II; died in Pennsylvania Hospital Dec. 11, 1947, aged 49, of pulmonary embolus and carcinoma of the pancreas.

Lawrence Eddy Goldman, St. Louis; Washington University School of Medicine, St. Louis, 1928; member of the American Medical Association; specialist certified by the American Board of Pediatrics, Inc.; instructor in clinical pediatrics at his alma mater; on the staffs of the St. Louis Children's and Jewish hospitals, a founder member of the Children's Research Foundation; died February 2, aged 44, of sarcoma.

Jane Lincoln Greeley, Jamestown, N.Y.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1897; member of the American Medical Association; died January 22, aged 83, of mitral regurgitation, influenza and Parkinson's disease.

Albert Holzahn Harris, Sioux Falls, S.D.; University of Nebraska College of Medicine, Omaha, 1939; specialist certified by the American Board of Pathology; at one time instructor in pathology at the University of Arkansas School of Medicine in Little Rock; served during World War II; affiliated with McKennan Hospital and Sioux Valley Hospital; died January 28, aged 35, of brain tumor.

Charles Eledzer Hawkes ● Greenville, R.I.; Harvard Medical School, Boston, 1901; an Affiliate Fellow of the American Medical Association; served during World War I; for many years associated with the Providence schools and Rhode Island Hospital in Providence; died January 31, aged 71, of coronary occlusion.

George Ives ● St. Louis; Johns Hopkins University School of Medicine, Baltimore, 1911; specialist certified by the American Board of Pathology, Inc.; member of the American Society of Clinical Pathologists; affiliated with the Josephine Heitkamp Memorial and Missouri Baptist hospitals; died in the Barnes Hospital February 3, aged 64, of bronchogenic carcinoma.

John C. Love, Texarkana, Ark.; Meharry Medical College, Nashville, Tenn., 1900; died February 7, aged 71.

Thatcher Miller ● San Diego, Calif.; College of Physicians and Surgeons, Baltimore, 1906; affiliated with the Mercy Hospital; died January 29, aged 62, of cerebral hemorrhage.

Boyd A. Muster, Lyons, Ky.; Louisville (Ky.) Medical College, 1907; formerly state senator and representative; found dead February 10, aged 65.

Michael Joseph Noone, Scranton, Pa.; University of Vermont College of Medicine, Burlington, 1904; censor of the Lackawanna County Medical Society; member of the American Medical Association; fellow of the American College of Surgeons; for many years affiliated with the Scranton State Hospital, St. Joseph's Children's and Maternity Hospital and the Mercy Hospital, where he died February 3, aged 64, of cerebral hemorrhage.

Carver Haines Osborne ● Brookline, Mass.; Boston University School of Medicine, 1921; died January 3, aged 50, of coronary thrombosis.

Frederick Reis, Boston; Tufts College Medical School, Boston, 1903; member of the American Medical Association; professor of biochemistry at his alma mater; died February 4, aged 71, of cerebral disease.

Howard Rink, Oelwein, Iowa; University of Louisville (Ky.) Medical Department, 1909; member of the American Medical Association; served during World War I; past president of the Fayette County Medical Society; died February 5, aged 68, of cerebral hemorrhage.

Charles Ennet Saulsberry, New Brunswick, N.J.; Jefferson Medical College of Philadelphia, 1894; member of the American Medical Association; died in Piscataway January 1, aged 77, of coronary thrombosis.

Mary I. Thompson Shaffer, Sellersville, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1898; died Dec. 28, 1947, aged 76, of angina pectoris.

De La Ray Signor, Philadelphia; Medico-Chirurgical College of Philadelphia, 1914; died in a local hospital Dec. 10, 1947, aged 60, of status asthmaticus.

Frederick Glazier Smith ● Somerville, Mass.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1893; past president of the Somerville Medical Society; during World War II served as a member of the Selective Service Board; affiliated with the Somerville Hospital; died January 9, aged 80, of coronary thrombosis.

Ellis H. Spainhour, Winston-Salem, N. C.; (licensed in North Carolina in 1898); member of American Medical Association; on the visiting staff of City Memorial Hospital; died Dec. 17, 1947, aged 76, of heart disease.

Fred K. Strasser, Hemet, Calif.; Homeopathic Medical College of Missouri, St. Louis, 1889; died January 20, aged 92, of heart disease.

Harold Linson Stratton, Worcester, Mass.; Tufts College Medical School, Boston, 1939; member of the American Medical Association; interned at Lowell General Hospital in Lowell, Mass.; served a residency at Boston State Hospital in Boston and the Worcester State Hospital; certified by the National Board of Medical Examiners; died in the Worcester City Hospital January 31, aged 37, of aneurysm of the arch of the aorta.

Charles Ira Trullinger, Harrisburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; member of the American Medical Association; for many years on the staff of the Harrisburg Hospital; died January 21, aged 66, of uremia, nephrosclerosis and arteriosclerosis.

Alvin Preston Utterback, Brackettville, Texas; University of Nashville Medical Department, 1910; member of the American Medical Association; city and county health officer and local physician for the Southern Pacific Railroad; past president and secretary of the Medina-Uvalde-Maverick-Val-Verde-Edwards-Real-Kinney-Terrell-Zavala Counties Medical Society; died in a hospital at New Orleans January 4, aged 59, after an operation for carcinoma of the right lung.

Luigi P. Verde, Boston; Regia Universith di Napoli Facolta di Medicina e Chirurgia, Italy, 1900; member of the American Medical Association; died January 8, aged 72, of coronary occlusion.

Edward Francis Weir ● Meadville, Mo.; University Medical College of Kansas City, Mo., 1899; president of the Linn County Medical Society; died January 30, aged 70, of heart disease.

Joseph Coulter Wiley, McKeesport, Pa.; University of Louisville (Ky.) School of Medicine, 1913; served during World War I; died Dec. 19, 1947, aged 60, of multiple sclerosis.

Edgar M. Wilson, Jefferson, Wis., Northwestern University Medical School, Chicago, 1891; died January 1, aged 83.

H. Pittsbugh Wolford, McKinney, Texas; Memphis (Tenn.) Hospital Medical College, 1904; member of the American Medical Association; past president of the Collin County Medical Society; served as city health officer; died January 6, aged 65, of heart disease.

William S. Wray, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1894; an officer during World War I; served as secretary of the Medical Club of Philadelphia; died in the Germantown Hospital February 2, aged 74, of gastric ulcer with hemorrhage and bronchopneumonia.

Francis Oliver Yost ● Los Angeles; Harvard Medical School, Boston, 1893; one of the founders and formerly professor of pediatrics at the College of Physicians and Surgeons; died in the California Hospital January 30, aged 76, of carcinoma of the colon.

Randall Zimmerman, Wilmerding, Pa.; Jefferson Medical College of Philadelphia, 1904; died in Los Angeles Dec. 11, 1947, aged 68, of coronary occlusion.

George Frederick Zinninger ● Canton, Ohio; Starling Medical College, Columbus, 1892; member of the House of Delegates of the American Medical Association in 1932, 1933, 1937 and 1938; past president of the Stark County Medical Society; died January 28, aged 80.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 23, 1948.

Attempt to Compose the Differences Between Government and Medical Association

In the conflict between the British Medical Association and the government over the National Health Service the Royal Colleges of Physicians, Surgeons and Obstetricians and Gynecologists have made an attempt at mediation. The Royal College of Physicians has sent to the Minister of Health two resolutions. The College affirms its desire for unity and recognizes that the comprehensive health service cannot be successful without the willing cooperation of all branches of the medical profession. It believes that this can be furthered if the Minister of Health makes clear in an amending act that a whole time service shall not be introduced by regulation, but that if any future government desires to introduce such a service a fresh Act of Parliament would be necessary. The college of physicians reaffirms its opposition to a whole time service. Second, it states that a principal cause of the present discontent with the National Health Service is the power possessed by the Minister of Health to change its character by regulations. The college therefore suggests that an amending bill be introduced to make regulations that affect the service subject to special procedure.

These resolutions of the Royal College of Physicians have received the general approval of the Council of the Royal College of Surgeons. In a letter to the Minister of Health the president wrote: "It is thought, however, that while the legislation suggested would relieve members of the medical profession of one of their most serious apprehensions, it would not be sufficient to secure the cooperation of all branches of the profession. It is therefore hoped that you will make such modifications in the present plans for the National Health Service, particularly in regard to the method of remuneration of general practitioners, as will bring them more into line with the views of the large majority of doctors and thus encourage members of the profession to give the service their general support."

In the House of Commons the Minister of Health, Mr. Bevan, replied. He said that he had been trying to determine what was really and sincerely worrying the doctor. No doubt as experience was gained many modifications would be found which would improve the scheme. But it seemed to him that beyond this the key to the physicians' uneasiness was some instinctive fear that the real objective of the act was a full time state medical service. He had given an assurance to the contrary for the present government, but he could not read into the minds of future governments. However, it now seemed clear to him that more than a spoken assurance was needed, and he was willing to do anything to banish apprehension for good. The Royal College of Physicians had made useful suggestions, with which the other royal colleges agreed, that he should make it statutorily clear that a whole time service would not be brought in by regulation but would require further legislation to make it possible. His colleagues and he accepted that most cordially. With regard to the disputed effect of the act on partnership agreements, he was about to set up an expert legal committee to advise him.

He then dealt with the profession's objection to the part payment of physicians by a sum of $1,200 a year as the "thin edge of the wedge" of a system of total payment in this way, and so the prelude to a whole time service. He had always considered it an assurance for the young beginner to have this payment. However, if physicians read sinister intentions in this, the object could be achieved in another way. Let all new entrants to practice have this assured payment of $1,200 for a period of, say, three years. Then let each decide for himself whether to forego it and pass to a system of plain capitation fees. He had no intention of interfering with the ordinary rights of doctors to express themselves in speech and writing with absolute freedom.

These statements of the Minister of Health were received with approval in all parts of the House of Commons and also by the council of the British Medical Association. A further meeting between representatives of the association and the minister has been arranged. The association has arranged the following: (1) With view to clarifying the situation a small number of written questions shall be submitted to the minister. (2) The minister shall be asked to discuss immediately the questions submitted. (3) After the minister's replies have been received and considered, another plebiscite of the whole profession is to be carried out by the association, as it is believed that no decision should be taken without this step.

Membership of the British Medical Association

The latest figures show that of 68,350 doctors registered in the British Isles 58,195 are members of the British Medical Association, a record number. This is 75 per cent of the total number, and, if retired practitioners are eliminated, amounts to 77.5 per cent. Between 1935 and 1946 the associations' membership increased by 5,000, but since 1940 the apprehensions aroused by the scheme of the socialist government to nationalize the practice of medicine have produced the unprecedented increase of 19,000.

Postgraduate Students from Czechoslovakia

In consequence of the downfall of Germany and the disastrous effects of her occupation of other European countries, Britain has become more than ever a medical Mecca. As the latest manifestation of this, eighty young Czechoslovak doctors are to work this year in British hospitals, as arranged by the ministers of health of both countries. They will attend hospitals in London, Birmingham, Bristol, Cardiff, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Newcastle and Sheffield. Fifteen will be in Britain for three months, the remainder for a shorter time.

BRAZIL

(From Our Regular Correspondent)

Rio de Janiero, April 16, 1948.

Relationship Between Some Factors of the Vitamin B Complex

Dr. F. A. Moura Campos, professor of physiology at the University of São Paulo, recently published a new paper on the series of experiments he is performing on the physiology of vitamins. He reports the interrelationship between some factors

of the vitamin B complex. Association of thiamine and riboflavin was considered first, and later of thiamine and pyridoxine. It was shown that thiamine is necessary to the complete utilization of riboflavin. In animals deprived of viatmin B_1 the growing capacity of riboflavin was not fully observed. In animals deprived of vitamin B_2 the biologic activity of thiamine was reduced. Pyridoxine increases the activity of thiamine in connection with the cure and prevention of beriberi. Wistar rats received a diet free from vitamin B complex. When the first attack of beriberi was observed thiamine was given, and the length of the interval until the next attack was recorded. This interval was called the protecting period. In earlier experiments it was seen that the length of the period was gradually reduced. In the present paper it was shown that pyridoxine given together with thiamine could lengthen the protecting period. Dr. Campos believes that to explain the sparing capacity of pyridoxine its effect on the metabolism of the lipids should be considered.

Incidence of Diabetes

Dr. Vasco Azambuja, of the Nossa Senhora do Socorro Hospital, an institution which serves a district of Rio de Janerio with a population of poor economic condition, published a paper on the incidence of diabetes in 5,000 women examined at the outpatient department of that hospital and 635 men in treatment on the wards. The cases of diabetes discovered among the women were 14, or 2.8 per thousand, and among the men were 6, or 9.5 per thousand. For the total of 5,635 patients of both sexes there were 20 cases of diabetes, or 3.5 per thousand. This is a low incidence of the disease, as has been shown for the whole country, in particular a few years ago by Dr. F. Carvalho Nunes in a detailed study previously reported. An important contribution to this low incidence is the relatively young age of the population of Rio de Janeiro (average age 26.5 years for Rio de Janeiro in 1940, as against 31.1 years for the United States in the same year). The average age of the 635 men was 41.4 years and that of the 5,000 women was 33 years. The low percentage of Jews in the population of Rio de Janeiro is certainly also a contributing factor. Still another factor is the low contribution of proteins in the diet of the population, as shown by a high hydrocarbon intake, varying from 60 to 80 per cent of the total caloric value of the diet in different sections of Brazil. In a large percentage of Dr. Azambuja's cases diabetes was associated with other diseases: 70.8 per cent of the diabetic patients had arterial hypertension, 41.6 per cent had syphilis, 23 per cent had rheumatism of various forms, 20.8 per cent had anemia, 12.5 per cent had pathologic conditions of the biliary ducts and 4.1 per cent had pulmonary tuberculosis. In the majority of the 20 cases the diabetes was of a slight and benign form.

Campaign Against Manson's Schistosomiasis

Dr. Goth Jansen, of the field staff of the Oswaldo Cruz Institute, published a progress report on the experimental demonstration of prophylaxis of Manson's schistosomiasis at Catende county, state of Pernambuco. The first district of the county was chosen for the demonstration because of the favorable conditions it presented: the easy access to streams, dams and ponds; the relatively high density of the population, and the high degree of cooperation promised by the social service of the local sugar mill. The largest part of the district's population lives on the shores of the Panelas River, which is used for bathing, fishing and laundry purposes, and for the disposal of excreta. The commonest snail of this district is Tropicorbis centimetralis, of which 2,631 specimens were examined with 199, or 7.56 per cent, positive for Schistosoma mansoni. Microscopic examination of the feces of 6,559 persons showed that 3,482 were positive for S. mansoni. The campaign against schistosomiasis, conducted for two years, has included five measures: (1) destruction of the intermediary host by the use of slaked lime; (2) the medical treatment of human carriers of the parasite; (3) construction of public baths and public tanks to discourage the use of the river for bathing and laundering; (4) construction of sanitary privies to decrease the contamination of soil and water, and (5) health education and propaganda. For the destruction of intermediary hosts twenty-seven applications of slaked lime were made at three month intervals, following the technic employed by Luttermoser in Venezuela (four to five parts per thousand). The measure was so effective that after a few applications of lime it was difficult to find snails in the district. But the results are temporary, as the snails increase after cessation of the applications. For the treatment of human carriers of the parasite several antimony preparations were tried. The best results were obtained by intravenous injections of antimony and potassium tartrate. A total of 1,990 persons were treated.

Shigellosis in Children

Dysentery, mainly bacillary, is still prevalent in Rio de Janeiro, as revealed by an average annual death rate of 8.5 per hundred thousand persons for the last three years. As a contribution to the solution of this problem, Drs. Arlindo de Assis and Vera L. Ribeiro, of the Fernandes Figueira Hospital for Children, published the results of an investigation of 1,331 children whose feces were examined for Shigellae. There were 807 children with intestinal discharges containing mucus, pus or blood, and in 237 of them (29.4 per cent) the authors could isolate various types of Shigellae.

Among 138 children examined post mortem, only 11 clinically had been suspected of intestinal disease, and 4 of these presented intestinal lesions produced by Shigellae; 3 others showed similar lesions caused by a special type of Proteus morgani characterized by a specific flagellar antigen common to all these pathogenic cultures. Postmortem examination of the 127 children without previous suspicion of intestinal disease disclosed lesions of acute enteritis as the cause of death of 22 of them. Six others, whose death was ascribed to nonintestinal diseases, presented concomitant specific enteritis by Shigellae.

These facts emphasize the importance of sources of infection in members of the household who are carriers of bacillary dysentery. Forty-five per cent of the Shigellae disclosed were of the Flexner group, with predominance of types I, II, III, I.III and II.VII (Weil). In decreasing importance there were Shigella paradysenteriae (18.7 per cent), Shigella alkalescens type I (9.9 per cent), Shigella dysenteriae (7 per cent), Shigella dispar type I Assis (7 per cent), Shigella ambigua (4.8 per cent), bacilli of the Large-Sachs group (2.6 per cent), Pr. morgani (2.2 per cent), Sh. dispar type II Assis (0.7 per cent) and individual samples of Sh. alkalescens types II and III and Sh. pseudodispar Assis.

Brief Items

The Brazilian Society of Sterility was founded recently in Rio de Janeiro, to study the medical and social problems related to sterility, abortion and contraceptive practices. The first president of the society is Dr. Arnaldo de Moraes, professor of clinical gynecology, University of Rio de Janeiro; the governing board includes Drs. Goulart de Andrade, A. Campos de Paz and Clovis C. Costa.

Medical Motion Pictures

FILM REVIEWS

The Fenestration Operation for Otosclerosis. 16 mm., color, silent, 1,175 feet (one reel), showing time forty-three minutes. Prepared by George E. Shambaugh Jr., M.D., Northwestern University Medical School, Chicago. Produced in 1947 by Marvin La Rue, Inc., Chicago. Endoscopic photography by Paul H. Holinger, M.D. Procurable on loan from the Audio-Visual Medical Education Department, Northwestern University Medical School, Chicago.

The details of the operation usually followed with difficulty even by an assistant, owing to the depth of the field and limited exposure, are clearly demonstrated. They are photographed in this production with such magnification as to make the fenestra, which is slightly over 1 mm. in width, clearly visible. The membranous labyrinth which is thereby exposed is also seen easily. The views of the surgical procedures are preceded by a series of diagrams and animated drawings to demonstrate the anatomy, the normal action of the sound-conducting mechanism, the development of a typical otosclerotic focus and its limiting effect on movement of the stapes, the various steps in the surgical procedure and, finally, the action of the new fenestra in enabling sound to reach the inner ear.

The animated drawings of the surgical procedures give a clear conception of the surgical objectives, and the repetition of the appropriate sections previous to each step in the operation is of great value in clarifying the procedure. The value placed on some minor details of technic such as continuous irrigation, wide exposure of enchondral bone beyond the fenestrated area and the use of a smooth gold burr in preventing osteogenesis may meet with some question on the basis of evidence so far available. From the point of view of physiology and acoustics a weakness exists in the portrayal of the action of the sound-conducting mechanism, since such details as axis of rotation, reduction of amplitude of movement and rocking motion of the stapes are not shown; also, the validity of the interpretation of the acoustics of the new conducting mechanism has yet to be established.

An objection may be raised that the references to results of the operation in the latter part of the film fail to give adequate information. In its present state a false impression may be created both as to end results to be expected and the relative value of a hearing aid. Since these questions have been raised in the film, the necessity is created for supplying fuller information as to failures and partial failures as well as to the degrees and percentages of successes. Such information could be easily added. From the surgical point of view the film is an excellent demonstration of the objectives and the surgical technic. The perfection with which the latter is carried out may fail to impress sufficiently the care and precision employed in its execution. The film is well captioned. It is suitable for otologists, general medical audiences and graduate students.

Appendicitis in Childhood. 16 mm., black and white, sound, 1,600 feet (one reel), showing time forty minutes. Prepared in 1941 by Joseph Brennemann, M.D., formerly professor of pediatrics, University of Southern California School of Medicine, Los Angeles. Produced by and procurable on loan from Wood Johnson & Company, Evansville, Ind.

The author gives a summary of his observations on appendicitis in childhood. This film will long be important because it expresses the author's sound clinical judgment. As a historical film it will be of interest for years to come. This lecture film shows only Dr. Brennemann. A few charts are used to illustrate his talk. His gestures are pointed and effectively supplement the spoken word. The film will hold the interest of those professionally interested in the clinical manifestations and the differential diagnosis of acute appendicitis in children. This film can be recommended to pediatricians, surgeons, general practitioners and medical students.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of the boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, May 22, page 406.

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Parts I & II. Various centers, June 21-23. Final date for filing application is May 22. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia 2.

EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: Written, Various Centers, July 16. Oral, Philadelphia, Oct. 10. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York 22.

American Board of Dermatology & Syphilology: Oral, Groups A & B, Ann Arbor, Oct. 21-23. Final date for filing application is Aug. 2, 1948. Written, Ann Arbor, Sept. 9. Sec., Dr. G. M. Lewis, 66 E. 66th St., New York 21.

American Board of Internal Medicine: Written, Oct. 18. Final date for filing application is June 1. Asst., Sec-Treas., Dr. W. A. Worrell, 1 West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Oral, Chicago, June 1949. Final date for filing application is Jan. 1949. Sec., Dr. W. J. German, 310 Cedar Street, New Haven, Conn.

American Board of Obstetrics and Gynecology: Part I, Various Centers, Feb. 4, 1949. Final date for filing application is Nov. 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh 1.

American Board of Opthalmology: Oral, Chicago, Oct. 6. Written, Various centers, Jan. 1949. Final date for filing application is July 1, 1948. Sec., Dr. S. Judd Bosch, 56 Ivie Rd., Cape Cottage, Maine.

American Board of Orthopedic Surgery: Part II, Chicago, January 1949. Final date for filing application is August 15. Sec., Dr. Francis H. McKeever, 1136 W. 6th St., Los Angeles 14.

American Board of Otolaryngology: Oral, Chicago, June 15-19. Sec., Dr. D. M. Lierle, University Hospital, Iowa City.

American Board of Pathology: Chicago, Oct. 8-9. Final date for filing application is Oct. 1. Sec., Dr. Robert A. Moore, 507 Euclid Ave., St. Louis.

American Board of Pediatrics: Chicago, June 25-27, Seattle, Sept. 10-12, Atlantic City, Nov. 17-19. Written, July 30. Sec., Dr. Lee F. Hill, 718 Royal Union Bldg., Des Moines, Iowa.

American Board of Plastic Surgery: Examinations are given in June and November of each year in the hometown of applicants. Sec.-Treas., Dr. Louis T. Byars, 400 Metropolitan Bldg., St. Louis.

American Board of Psychiatry and Neurology: Oral, All Groups, San Francisco, October. Final date for filing application is July 15. Sec., Dr. P. J. Bracelend, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Radiology: Nov. Final date for filing application is Sept. 1. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

American Board of Surgery: Written, Part I, Oct. Final date for filing application is July 1. Sec., Dr. J. S. Rodman, 225 S. 15th St., Philadelphia.

American Board of Urology: Chicago, Feb. 12-14, 1949. Sec., Dr. Harry Culver, Route 613, Sunnyside Rd., Minneapolis 4.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Paternity: Results of Blood-Grouping Test Not Binding On Jury.—The plaintiff filed a bastardy action against the defendant, alleging him to be the father of a child born to her on May 23, 1946. From a judgment for the plaintiff, following a jury trial, and from an order overruling the defendant's motion for a new trial, the defendant appealed to the Supreme Judicial Court of Maine.

There was ample evidence, said the court, to satisfy the jury that the defendant had sexual intercourse with the complainant on Aug. 12, 1945 and that she gave birth to a child on May 23, 1946. Except for the blood-grouping test referred to later, there was no evidence whatsoever that any one other than the defendant could have been responsible for her pregnancy. He did not take the stand to deny her story and in conversations with her mother and father inferentially admitted that he was responsible for her condition. In accordance with the provisions of Revised Statutes 1944, chapter 153, section 34, the court ordered a blood-grouping test to be made to determine whether or not the paternity of the defendant could be excluded. The value of these tests in determining the issue of nonpaternity, said the Supreme Judicial Court, was recognized by the legislature of this state nine years ago when the aforementioned statute was enacted. This statute makes it mandatory for the court, on motion of the defendant in a bastardy case, to order such a test and makes the result admissible in evidence where it shows nonpaternity. The tests in the instant case were made by, or at least under the direction of, Dr. Hooker, one of the leaders in this research work. According to his testimony they show that the mother's blood group formula is O-M-N, that the child's is O-M, and that the defendant's is A-N. A and O in these cases refer to what are called groups, M and N to types. And the doctor states categorically that it is a biologic law that a male with type N blood cannot be the father of a child with type M blood by a mother with type M blood. By the application of this law to the case before us, he definitely excludes the defendant as the father of this child.

We are not disposed, said the Supreme Judicial Court, to close our minds to conclusions which science tells us are established. Nor do we propose to lay down as a rule of law that the triers of fact may reject what science says is true. The application of scientific principles to the facts of a particular case, however, where so many important issues, life and death, legitimacy or illegitimacy, and the right of inheritance, may be involved, still remains the province of the court. We have here, the court continued, a clearcut question: In the face of unrefuted evidence that the complainant and the respondent had sexual intercourse on a certain date, that a child was born within the normal period of gestation, and in the absence of any evidence that any one else could have been the father of that child, must we accept the testimony of the doctor as to the blood tests as conclusive on the issue of nonpaternity? In weighing the overwhelming evidence for the plaintiff, outside of the blood tests, did not the jury have the right to decide that there may have been some error in the handling of blood or serums or some mistake in the conclusions of laboratory technicians as to what they found? We do not believe that the statute intended to make the result of a blood-grouping test conclusive on the issue of nonpaternity. It says only that the result of such test "shall be admissible in evidence." In a case where testimony is conflicting or where access by others to the plaintiff may be shown, such test may be decisive, but that is not the case before us. To sustain defendant's motion would be to hold as a matter of law that such a blood test is conclusive. That we cannot do. The statute does not require it, and no case which we have found so holds. Believing as we do that the jury could, in considering all the testimony, have rejected the accuracy of the blood-grouping tests in this instance, the court concluded, we cannot say that their finding is manifestly wrong. Accordingly the judgment in favor of the plaintiff was affirmed and the defendant's motion for a new trial overruled.—*Jordan v. Davis, 57 A. (2d) 209 (Maine, 1948).*

Charitable Hospitals: Effect of Indemnity Insurance on Liability for Negligence.—The plaintiff filed suit against the defendant hospital for damages alleged to have resulted in the death of his infant son caused by the negligence of the defendant and its servants and agents. From a verdict and judgment in favor of the plaintiff the defendant appealed to the Supreme Court of Errors of Connecticut.

The determinative issue on this appeal, said the Supreme Court of Errors, is the effect to be accorded to the existence of insurance on the immunity of a charitable hospital for tort liability. The plaintiff, as administrator, charged the hospital and its servants and agents with negligence causing the death of his infant son, in answer to which the defendant alleged that it was a charitable corporation. The plaintiff pleaded in reply thereto that the defendant carried insurance indemnifying it and its property, funds and assets against all liability for negligence and agreed to limit his recovery to the indemnity procurable under the insurance policy. He argued that by carrying insurance and thus protecting its trust funds and other property from depletion the defendant was estopped from claiming the charitable immunity. At the trial the plaintiff admitted that the defendant was a charitable corporation and the defendant admitted that it was insured.

The plaintiff's claim, said the Supreme Court of Errors, has a certain meritorious basis, for, except as to premiums, the funds of the hospital are protected to the extent of the collectible insurance when it is insured. Nevertheless, it is not valid. If the charitable institution is not liable for the negligence alleged, it cannot be made liable because it took out insurance which would cover a judgment recovered against it. The fact is irrelevant to the question of liability. Continuing, the Supreme Court of Errors pointed out that if the plaintiff's contention should prevail, the result would be that a plaintiff negligently injured in an insured hospital would get judgment while a plaintiff injured in an uninsured hospital would not. The distinction, the court concluded, has no logical basis. Accordingly the judgment in favor of the plaintiff was set aside and a new trial was ordered.—*Cristini v. Griffin Hospital, 57 A. (2d) 262 (Conn., 1948).*

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1937 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted.

Archives of Internal Medicine, Chicago

81:1-114 (Jan.) 1948

Cryptococcosis: Report of Case and Experimental Studies. E.B. Reilly and E.L. Artom.—p. 1.
Complete Atrioventricular Block in Diphtheritic Myocarditis: Report of Case with Serial Electrocardiographic Tracings. F.C. Massey and W.J. Walker.—p. 9.
*Lipomelanotic Reticular Hyperplasia of Lymph Nodes: Report of 6 Cases. T.C. Laipply.—p. 19.
Adenomas of Adrenal Cortex. R.R. Commons and C.P. Calloway.—p. 37.
Metabolic Studies in Diabetic Acidosis. II. Effect of Administration of Sodium Phosphate. M. Franks, R.F. Berris, N.O. Kaplan and G.B. Myers.—p. 42.
*Chronic Recurrent Pancreatitis: Clinical Study of 20 Cases. S.N. Maimon, J.B. Kirsner and W.L. Palmer.—p. 56.
Acute Hypoharyocytic Leukemia. J.B. McDonald and Jewell G. Hamrick.—p. 73.
Syphilis: Review of Recent Literature. F.W. Reynolds and J.E. Moore.—p. 85.

Lipomelanotic Hyperplasia of Lymph Nodes.—Laipply reports 6 cases of chronic dermatitis, pruritus and lymphadenopathy. He stresses that chronic dermatitis, particularly when accompanied with pruritus, may result in a characteristic type of hyperplasia of lymph nodes. The lymph nodes are usually moderately enlarged, discrete, firm and nontender. They frequently have a yellow tinge and occasionally show dark brown mottling. The microscopic features include slight distortion of the normal architectural pattern, severe hyperplasia of reticular cells, which contain melanin and sudanotropic droplets, and infiltration with eosinophils. The secondary centers of the lymph follicles are sometimes evident, but the notable proliferation of reticular cells is in the pulp of the lymph nodes. In many instances an incorrect clinical diagnosis of lymphoblastoma may be made because of the prominence of the lymphadenopathy. A diagnosis of lipomelanotic reticular hyperplasia of lymph nodes does not preclude the possibility of the concomitant existence of a lymphoblastoma. Thus in 2 of the cases reported in this paper there were changes in the blood and tissues that warranted the diagnosis of Schilling's monocytic leukosis. Lipomelanotic reticular hyperplasia of lymph nodes is a benign lesion that is secondary to chronic pruritic dermatitis. Although it may be associated with leukemia, Hodgkin's disease or lymphosarcoma, it has no direct relationship to them.

Chronic Recurrent Pancreatitis.—Maimon and his associates review observations on 20 cases of recurrent pancreatitis, 12 in men and 8 in women. Half of the patients were less than 50 years of age. In 8 the symptoms had been present for less than 1 year, in 12 the average duration was four years. The condition is characterized by repeated bouts of severe pain in the upper part of the abdomen. A diabetic type of curve following the oral test for dextrose tolerance in the presence of such attacks suggests the presence of pancreatitis. Pancreatic calcifications are not infrequently found roentgenologically. Disturbances of carbohydrate metabolism are frequent. Steatorrhea is not uncommon. The possibility of pancreatitis must be especially considered in cases in which the patient continues to have attacks of pain simulating that of biliary colic after cholecystectomy has been performed.

Archives of Pathology, Chicago

45:1-134 (Jan.) 1948

Primary Systemic Amyloidosis. Lalla Iverson and A. B. Morrison.—p. 1.
Mechanisms Concerned in Necrosis Effected by Unsaturated Fatty Acid. E. Nylen and E. B. Smith.—p. 21.
Myocardium After Sulfonamide Therapy. R. M. Fawcett.—p. 25.
*Chronic Carbon Dioxide Poisoning: Experimental Studies. H. Meessen.—p. 36.
Hepatic Abscess. Factors Determining Its Localization. T. D. Kinney and J. W. Ferrebee.—p. 41.
Chemical Character of Enterochromaffin Cells. G. Gomori. p. 48.
Triple Synchronous Primary Carcinoma. B. S. Gordon.—p. 56.
Lymphoid Diseases. Hodgkin's Granuloma, Giant Follicular Lymphadenopathy, Lymphoid Leukemia, Lymphosarcoma and Gastrointestinal Pseudoleukemia. D. Symmers.—p. 73.

Chronic Carbon Dioxide Poisoning. Meessen points out that employees of wine cellars and cold storage plants using solid carbon dioxide and crews of submarines may undergo prolonged exposure to an atmosphere containing sublethal concentrations of carbon dioxide. He describes anatomic reactions observed in dogs, rabbits, guinea pigs and rats exposed repeatedly and over long periods to sublethal doses of atmospheric carbon dioxide. The animals presented degenerative changes in the lungs, the liver, the kidney and the brain. These lesions were the result of the increased carbon dioxide tension and were not caused by anoxemia.

Journal of Lab. and Clinical Medicine, St. Louis

33:1-134 (Jan.) 1948

*Further Experiences with Streptomycin Therapy in United States Army Hospitals. E. J. Pulaski and S. F. Seeley.—p. 1.
*Serologic Studies of Influenza Made in Boston During Winter of 1945-1946. M. Finland, Mildred W. Barnes, M. Meads and E. M. Ory.—p. 15.
Influenza and Pneumonia. M. Finland, E. M. Ory, M. Meads and Mildred W. Barnes.—p. 32.
Nutritional Status and Infection Response. J. Wetcoff, Dorothy B. Darling, Margaret H. Scanlon and F. J. Stare.—p. 47.
High Vitamin A Intake and Blood Levels of Cholesterol, Phospholipids, Carotene, and Vitamins C, A, and E. J. T. Van Bruggen and J. V. Stroumfjord.—p. 67.
Comparative Study of Micro- and Macroelectrophoretic Analysis of Human and Rat Serum. P. P. Cohen and Frances L. Thompson.—p. 75.
Sternal Marrow Hemosiderin. C. E. Rath and C. A. Finch.—p. 81.
Occurrence of Toxoplasma Neutralizing Antibodies in Various Disease Conditions. I. Huchman.—p. 87.

Streptomycin in Army Hospitals.—Pulaski and Seeley say that the investigation of streptomycin that was begun in 1945 is still continuing. They review experiences with streptomycin in 1,200 patients. The wide variation in sensitivity of bacterial species to streptomycin emphasizes the importance of checking the causative organisms in the laboratory for their susceptibility prior to therapy wherever possible. Present indications for strep-

tomycin include gram-negative infections of the urinary tract; tularemia, bacteremia, pneumonia and meningitis due to susceptible organisms, and certain otolaryngologic conditions associated with gram-negative bacteria. Bacterial pneumonitides caused by streptomycin-susceptible organisms are likely to manifest good responses. Results in bronchiectasis and empyema have not been spectacular. Acute brucellosis with bacteremia was favorably influenced when streptomycin was given in combination with sulfadiazine. Streptomycin is of no value against chronic brucellosis. Results in typhoid have not been encouraging. Streptomycin shows promise in the treatment of bacillary dysentery refractory to sulfonamide drugs and in some types of Salmonella infection. It may be influential in bringing about a remission in active idiopathic ulcerative colitis with severe secondary infection caused by susceptible organisms. The drug is not useful against amebic colitis. Striking results have been obtained with streptomycin therapy in a few patients with early diffuse peritonitis, but the most consistent beneficial effects were noted when the streptomycin was given in combination with penicillin. Streptomycin is complementary to penicillin in the surgical management of wound infections and may be of value in certain lesions heavily infected with fecal organisms. Streptomycin has been useful in certain forms of tuberculosis, but its use is not without danger. Untoward reactions, especially on the vestibular portion of the eighth cranial nerve, are a common feature of the courses of therapy necessary to affect tuberculous lesions. These effects are slow to reverse themselves, and some damage may be permanent.

Serologic Studies of Influenza.-Finland and his co-workers state that both influenza B and influenza A were prevalent in Boston during the winter of 1945-1946. Influenza B was responsible for the major outbreak that occurred in December 1945, and no acute cases proved to be due to this virus were encountered after the first week in January. Cases of serologically proved influenza A were encountered almost entirely after the middle of January. Two cases were observed in which there was definite serologic evidence of consecutive infections first with influenza B and a few weeks later with influenza A. There was also some evidence of symptomless infections with viruses of both types. Almost all the patients in whose serums a rise in specific antibodies to one or another of the influenza viruses was demonstrated had respiratory and systemic symptoms which were characteristic of clinical influenza. Similar symptoms were noted during the same period in other persons whose serums failed to show such a rise. A large proportion of the patients who failed to show a rise in influenzal antibodies, however, had an illness which was more like the common cold or had predominantly gastrointestinal symptoms.

Journal of Nutrition, Philadelphia

35:1-136 (Jan.) 1948. Partial Index

Congenital Malformations Induced in Rats by Maternal Vitamin A Deficiency: II. Effect of Varying Preparatory Diet on Yield of Abnormal Young. J. Warkany and Carolyn B. Roth. —p. 1.
Nutrition of Mouse: II. Effect of Diet on Bacterial Flora of Intestine and Cecum. Lorraine S. Gall, P. F. Fenton and G. H. Cowgill. —p. 13.
Effects of B Vitamins, Liver and Yeast on Growth Under Cold Room and Room Temperature Conditions. E. B. Smith, B. H. Ershoff, H. J. Winsler and H. J. Deuel Jr. —p. 59.
*Effect of Vegetarian Self-Selection Diets on Reproduction and Growth of Offspring of Rats. A. J. Carlson and F. Hoelzel. —p. 69.
Human Utilization of Ascorbic Acid from Mustard Greens. Martha E. Hollinger. —p. 73.
*Further Experiments on Relation of Fat to Economy of Food Utilization: III. Low Protein Intake. C. E. French, A. Black and R. W. Swift. —p. 83.
Effect of Dietary Restriction of B-Complex Vitamins and Protein on Excretion of Creatinine by Human Subjects. T. E. Friedemann, Velma H. Kinsey, G. H. Berryman and others. —p. 117.

Effect of Vegetarian Diets on Reproduction of Rats.—Carlson and Hoelzel found that rats on vegetarian self selection diets including corn (whole kernels), wheat (whole grains), pearled barley, rolled oats, sunflower seeds, peanuts, soy beans, green peas, corn germ meal, wheat germ meal, brewers' yeast, alfalfa leaf meal, sodium chloride, lettuce and celery cabbage were found to be generally fertile but raised less than 25 per cent of their offspring. They raised none in winter. The growth of these young was also subnormal, and severe rickets commonly developed.

Fat Utilization and Low Protein.--French, Black and Swift in previous studies had demonstrated that liberal amounts of fat in the diet of the growing rat resulted in a superior energy utilization of the diet as a whole. In the preparation of the diets used in these experiments an effort was made to furnish all nutrients in optimum quantities for the most efficient utilization of the food energy, including an excellent quality of protein mixture furnishing 22 per cent protein in the diet. In view of the shortages of foodstuffs in many areas, especially of fat and protein, it seemed of further interest to investigate the effect of decreases in the dietary protein in similar high and low fat diets on the resultant utilization of energy. Studies on rats indicated that decreasing the protein intake from the former level of 22 per cent to 7 per cent of the diet did not alter the previously reported superior energy utilization of high fat diets by the growing rat. In the present experiment an increased weight gain, increased body gains of fat and energy and decreased heat production were associated with the high fat ration.

Laval Medical, Quebec

13:1-134 (Jan.) 1948. Partial Index

*Treatment and Cure of Primo-Secondary Syphilis With Bismuth. E. Gaumond. -p. 12.
Arteriosclerotic Dementia in a Man Aged 59. S. Caron. -p. 28.
Recklinghausen's Disease; Case Report and Anatomico-Clinical Observation. M. Samson and L. Patry. -p. 37.
Congenital Malformations; Micromelia - Macromelia. G.H. Le Roy, P. Michel and G. Parodis. -p. 48.
*Obesity at Puberty. R. Lemieux and A. Hartel. -p. 60.

Bismuth Therapy of Syphilis.—Gaumond treated 10 patients, 5 men and 3 women between the ages of 50 and 73, one girl aged 14 and 1 man aged 26, who had primo-secondary syphilis, with a bismuth compound alone. Various bismuth preparations were used, all of them insoluble bismuth salts containing 0.0646 Gm. to 0.08 Gm. of metallic bismuth per cubic centimeter. The dose injected by muscular route varied from 1 to 2 cc. Treatment was initiated with two to three injections per week. A course of treatment consisted of twelve to twenty injections. A two weeks' rest was given between the first and second series of injections, and the rest periods were prolonged with progress of the treatment. The total number of injections varied from seventeen to one hundred and fourteen. Except for mild gingivitis there were no untoward reactions. The patients were followed for one and a half to nine years. Nine patients had strongly

positive Bordet-Wassermann and Kahn reactions before treatment was instituted. The tenth patient showed Treponema pallidum in dark field examination. After six to nine months of the treatment the serum of all the patients became negative. The cutaneous mucosal lesions healed rapidly. On the average, nine months' treatment with two injections per week, the rest intervals not counted, seems to be sufficient to obtain a cure. In patients over 50 years of age treatment with trivalent arsenic is contraindicated. Basic treatment with a bismuth salt combined with penicillin may be the method of choice for early syphilis.

Obesity at Puberty.--Lemieux and Martel report 56 obese children, 38 girls and 18 boys, between the ages of 12 and 16 years. In contrast to earlier concepts it is suggested that obesity at puberty need not be caused by an endocrine disorder. Cases of hypophysial obesity are rare and cases of hypothyroid obesity are less frequent than usually believed. Twenty-four of the children had a normal basal metabolic rate; in 29 the basal metabolic rate was lowered and in 3 instances it was increased. There was almost no increase in the cholesterol level of the blood which may be considered as a more reliable proof of the activity of the thyroid in children. In 90 to 95 per cent of the cases an alimentary factor must be considered as the basic cause of the obesity, although the possibility of a temporary deviation in the endocrine system or the hypothalamus should not be excluded. The gluttony of the obese children may be favored by a psychological factor associated with lack of emotional maturity. Simple obesity seldom interferes with the course of puberty, which was normal in 33 of the author's cases, precocious in 14 and delayed only in 9. The obese children should be placed on a diet which provides for a daily ration of about 1,200 calories comprising 80 to 100 Gm. of carbohydrates, 60 to 80 Gm. of proteins and 40 to 50 Gm. of fats. Dextro-amphetamine administered in doses of 2.5 mg. before every meal diminishes the appetite and at the same time increases the physical capacity by intensifying the desire for activity. The administration of theophylline or of ammonium chloride may mobilize the edema of the tissues. Thyroid therapy is to be employed only in cases in which the basal metabolic rate is below 10 per cent.

New Jersey Medical Society Journal, Trenton

45:1-50 (Jan.) 1948

*Occupational Beryllium Poisoning in New Jersey: with Special Reference to Its Incidence, Diagnosis and Compensation. H. S. Hartland, H. A. Brodkin and H. S. Hartland Jr. -p. 5.
Treatment of Undulant Fever with Streptomycin. J. A. Strazza Jr. -p. 15.
Treatment of Peptic Ulcer with Casein Hydrolysate. M. Smith and B. Friedenthal. -p. 17.
Wile's Tumor. A. O. Wilensky. -p. 21.
Hoarseness. F. J. Putney. -p. 23.
Background of Cancer Control Program. J. H. Kler. -p. 27.

Occupational Beryllium Poisoning.--The Hartlands and Brodkin present 4 fatal cases of beryllium poisoning. The first case occurred in 1934 but at that time was not recognized as having been caused by beryllium. In 1944 deaths were occurring among workers in a fluorescent lamp factory in Massachusetts who were exposed to a phosphor containing zinc beryllium silicate. The late Dr. L. U. Gardner of Saranac, N.Y., found a chronic pulmonary granulomatosis closely resembling a sarcoid as the cause of death in these patients and they were spoken of as the "Salem sarcoids." A case referred to the medical examiner of New Jersey in 1944 showed lesions practically identical to the so-called "Salem sarcoids." This case, which is the second of the 4 fatal ones presented here, again illustrates the difficulty in recognition of chronic beryllium poisoning. The third and fourth cases reviewed here were observed in 1947. Based on a study of these 4 cases, the Van Ordstrand report describing the exposure, symptomatology and pathology of acute beryllium poisoning, the Hardy and Tabershaw report describing the exposure, symptomatology and findings in chronic beryllium poisoning and the research done at Saranac by Gardner, who put chronic beryllium poisoning on a firm pathologic basis and produced the lesions in experimental animals, the authors are of the opinion that industrial beryllium poisoning is well established. In addition, in case 4 the recovery of beryllium in most of the organs allows to complete the postulates used in medicolegal work. The authors discuss the incidence, the signs and symptoms, the roentgenologic aspects, the differential diagnosis, the treatment and the compensation aspects of beryllium poisoning.

Public Health Reports, Washington, D. C.

63:97-128 (Jan. 23) 1948

Some Improvements in Performance Test for Rating Dishwashing Detergents. F. I. Norris and C. C. Huchhoft. --p. 97.
Studies in Enterococcal Food Poisoning: I. Isolation of Enterococci from Foods Implicated in Several Outbreaks of Food Poisoning. L. Buchbinder, A. G. Osler and G. I. Steffen. --p. 109.

63:129-160 (Jan. 30) 1948

Comparison of Effectiveness of 5 and 10 per cent DDT Dusts for Control of Rat Fleas. H. P. Nicholson and T. B. Gaines. -p. 129.
Notes on Preparation of Chlorine-Demand-Free Water. S. Wegrogian. -p. 137.
Report of Brucellosis Outbreak at Federalsburg, Md. J. H. Steele and J. W. Hastings Sr. -p. 144.

63:161-200 (Feb. 6) 1948

Complement Fixation Test for Histoplasmosis: I. Technic and Preliminary Results on Animal Serums. D. J. Tenenberg and A. Howell Jr. -p. 163.
Id: II. Preliminary Results with Human Serums. W. L. Forcelow, I. L. Bunnell and D. J. Tenenberg. -p. 169.
Efficiency of Methods for Isolation of Histoplasma Capsulatum. A. Howell Jr. -p. 173.
Studies of Fungus Antigens: II. Preliminary Report on Isolation of a Immunologically Active Polysaccharide from Histoplasmin. F. W. Cross and A. Howell Jr. -p. 179.
Verification of Diagnosis of Tuberculosis. C. E. Woodruff. -p. 184.
Mechanism of Immunity and Allergy in Tuberculosis. J. K. Weissfeiler. -p. 190.

West Virginia Medical Journal, Charleston

44:1-24 (Jan.) 1948

Some Practical Considerations in Management of Arthritis, J. L. Hollander. --p. 1.
*Psychiatric Considerations in Management of Tuberculosis. W. B. Rossman. --p. 7.
Tuberculosis Diagnostic Services in West Virginia. M. S. Lauder and E. P. Wells. --p. 10.
Renal Papillary Necrosis Complicating Diabetes Mellitus: Review of Literature with Case Report. H. J. Stevens, S. Northammer and J. S. Pearsons. -p. 12.

Psychiatric Problems in Tuberculosis.--Rossman believes that etiologic concepts of tuberculosis should be revised to include a consideration of the role that emotional conflict plays in the development of the disease. Two illustrative case reports are cited, showing the effect of emotional conflict on the progress of tuberculosis. The need for a unified program of medical, psychiatric and sociologic treatment of tuberculosis is stressed.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Annals of Rheumatic Diseases, London

6:195-262 (Dec.) 1947

*Psychogenic Rheumatism: Musculoskeletal Expression of Psychoneurosis. E.V. Boland. -p. 195.
Psychogenic Arthralgia. H.P. Wright. -p. 204.
Case of Calcinosis Circumscripta. D.L. Woolf. -p. 208.
Significance of Subcutaneous Nodules in Rheumatoid Arthritis. M. Lucchesi and O. Lucchesi. -p. 219.
Hypersensitivity to Colchicine. J.G. Macleod and L. Phillips. -p. 224.
Agglutination of Hemolytic Streptococci (Group A) in Serum from Patients with Rheumatoid Arthritis. K. Kulbak. -p. 230.
Etiology of Fibrositis: Review. M. Valentine. -p. 241.

Psychogenic Rheumatism.—Boland lists disturbances in the gastrointestinal, cardiovascular, respiratory, genitourinary and nervous systems and in the skin that are generally recognized as psychosomatic. He points out that physicians are not so familiar with the fact that disabilities of the locomotor system frequently result from psychic causes. He shows that psychogenic rheumatism must be included among the common rheumatic disorders along with osteoarthritis, rheumatoid arthritis, primary fibrositis and rheumatic fever. Its incidence was appallingly high among soldiers with musculoskeletal incapacities admitted to military general hospitals and special arthritis centers. At such installations psychogenic rheumatism was the most frequent cause of disability (34 per cent) in 450 consecutive cases of soldiers with rheumatic complaints admitted to an Army general hospital in the United States. Diagnosis of psychogenic rheumatism depends on (1) absence of organic disease or insufficient disease to account for the disability, (2) qualitative functional characteristics of the disability and (3) positive diagnosis of psychopathology. The most common symptoms are pain, tenseness, stiffness, limitation of motion, subjective sense of swelling, muscular fatigue and weakness of an involved part. Associated functional manifestations (headaches, dyspepsia, globus hystericus, sighing respirations, precordial pains, insomnia, tremors, cold moist hands and feet, anxiety and nervousness) are present in the majority of cases. In practically all instances evidence of previous neurotic traits may be elicited. The precipitating emotional factors are often difficult to ferret out, but smoldering resentment seems to be the common basic psychopathologic factor in psychogenic rheumatism. In remarks about the terminology the author says that the term psychogenic rheumatism, although objectionable to some, is convenient and compact.

Acta Radiologica, Stockholm

28:417-862 (Nov. 13) 1947. Partial Index

*Estrogens and Tumor Genesis. B. Zondek.—p. 433.
Parametritis as First and Only Symptom of Cervical Carcinoma During Pregnancy. B. Ebeniss and A. Sjövall. —p. 493.
Methods to Reduce Dangers of Radiotherapy in Cancer of Uterus. D. Den Hoed.—p. 497.
Carcinoma of Ovary Developing on Basis of Ovarian Endometriosis. H. Rauramo.—p. 638.
Rectal Injuries Following Stockholm Method of Treatment of Cancer of Cervix Uteri. A. Ingelman-Sundberg.—p. 760.

Estrogens and Tumor Genesis.—According to Zondek the question of correlation between the sex hormones and tumor genesis is of utmost clinical and theoretic importance. There exist reports in the literature of benign tumors arising in the genital organs of both women and animals after administration of estrogenic hormone. Carcinogenic effect of estrogen has been reported in rodents and occasionally in monkeys. In the human subject no convincing results could be demonstrated. The fact that estrogen is used for treatment of cancer (prostate, breast) contradicts the carcinogenic action of estrone. He believes that only exceedingly prolonged administration of estrone might cause undesirable results. He advises great caution in the administration of estrogenic hormone in women with cystic mastitis or cervical erosion, as well as in women belonging to cancerous families.

Nordisk Medicin, Gothenburg

36:2307-2366 (Nov. 21) 1947. Partial Index

*Clinical Picture of Tumors of Adrenal Cortex. E. Dahl-Iversen and T. C. Højensgaard. -p. 2307.

Hospitalstidende

Treatment of Migraine by Intravenous Injections of Hemigenose. T. Dalegaard-Nielsen. -p. 2315.

Duodecin

Gastroenteritis Epidemic Due to S. Enteritidis Var. Denver (Ratin). U. P. Kehlet. -p. 2325.

Norsk Magasin for Laegevidenskapen

BAL Treatment of Thrombopenic Purpura after Arsphenamine Intoxication. T. Kahre. -p. 2329.

Hygiea

Fractional Determination in Perticosed Lumbar Puncture. Thirty-Five Determinations in 31 Cases of Epilepsy. R. Eeg-Olofsson. -p. 2361.

Sedimentation Reaction and Getting Up in Acute Polyarthritis. L. Brahme. -p. 2355.

Case of Hoerfordt's Syndrome in Schaumann's Disease. L. Arin. -p. 2359.

Clinical Picture of Tumors of Adrenal Cortex.—Dahl-Iversen and Højensgaard say that tumors of the adrenal cortex cause sexual hormonal effects, combined sexual and metabolic effects and purely metabolic effects on the organism. Tumors with excess production of androgenic hormones occur in boys and girls before puberty and in women, usually young women. Tumors with combined sexual and metabolic effects are commonest and occur mainly in somewhat younger women. Cortical tumors with purely metabolic changes appear in men and women, more often in women. Hyperplasia and tumors of the adrenal cortex, tumors of the pituitary glands, the pineal glands and the gonads are closely related. Secretion of more than 200 international units of androgen in the urine in twenty-four hours points to a tumor of the adrenal cortex. In differential diagnosis between hypophysis affection and affection of the adrenal cortex the only certain aid is bilateral operative exploration. It is advised in all cases with Cushing's syndrome. Cortical tumors on the left side predominate, and exploration first on this side is in order. Treatment of tumors of the adrenal cortex is operative. Preoperative and postoperative administration of cortical hormones has reduced the operative mortality. The Shipley incision or its modification affords the best access in tumors with known localization. In bilateral exploratory intervention the authors advocate lumbar incision, vertical or diagonal, parallel with the twelfth rib. Two cases of hormone-producing cortical tumors of the adrenals of pure sexual type treated during the past year are described, the one, bilateral, in a woman aged 44, the other, on the right side, in a girl aged 6.

Book Notices

Principles of Occupational Therapy. Edited by Helen S. Willard, B.A., O.T.R., Director, Philadelphia School of Occupational Therapy, Philadelphia, and Clare S. Spackman, B.S., M.S. in Ed., O.T.R., Director, Curative Workshop, Philadelphia School of Occupational Therapy. Cloth. Price, $4.50. Pp. 416, with 46 illustrations. J. B. Lippincott Co., 227-231 S. 6th St., Philadelphia 5, 1947.

This book reports the work of the authors and nineteen other outstanding leaders who bring together in this volume the principles of occupational therapy. The book points out that principles of occupational therapy have been utilized for centuries in the management of the care of patients. In modern times its value was recognized in World War I, but there was little carryover from the military to civilian hospitals. Great strides were made during World War II, and the importance of its activities in the dynamic program of rehabilitation has made it one of the most talked about subjects in medical service. The development of interest in physical medicine, which includes both occupational and physical therapy, has given further stimulus to training and practice in this field. The authors point out that occupational therapy as a method of treatment can do much to shorten convalescence and improve the degree of recovery. They therefore believe that its methods are destined for broad use in hospitals.

The book is divided into two sections. Section I is entitled "Basic Concepts" and is composed of five chapters. A feature of each chapter which will be appreciated by all who read this book is the boxed-off list of chapter topics. Each topic is capitalized within the chapter, thereby making work with the book especially easy. Section II has fourteen chapters, the larger of which are divided into parts. A good index at the end adds much to the value of this book. In addition to well organized textual material there are numerous blank forms, charts, diagrams and pictures; references to periodicals, books and pamphlets are numerous and appear at the end of each chapter. Doctors, nurses, medical students, social workers and, of course, occupational therapists will want this basic textbook in their libraries because it is interesting and easy to read.

The Story of Hypnotism. By Robert W. Marks. Cloth. Price, $3. Pp. 246. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, 1947.

The revival of hypnotism as a means for treating psychologic disorders has stimulated the public's interest in this controversial subject prematurely. However, the author, writing for the public, has succeeded in presenting the outlines of hypnotism understandingly and accurately. He describes the rise of animal magnetism under Mesmer's influence and its decline caused by bias within medical circles. Hypnotism later revived under medical auspices but again declined as a result of its use as a direct attack on symptoms rather than on their pathogenic complexes. The author proceeds from individual hypnotism to describe examples of mass suggestion and to reveal how crowds have been influenced. This social phenomenon is of topical interest and highlights the value of the book for the education of the public.

Nutrition in Health and Disease. By Lenna F. Cooper, R.N., M.A., M.N.E., Chief, Department of Nutrition, Montefiore Hospital, New York, Edith M. Barber, B.S., M.S., and Helen S. Mitchell, A.B., Ph.D., Dean, School of Home Economics, University of Massachusetts, Amherst, Mass. Tenth edition. Cloth. Price, $4. Pp. 729, with 132 illustrations. J. B. Lippincott Co., 227-231 S. 6th St., Philadelphia 5, 1947.

This textbook for nurses and valuable reference book for dietitians and home makers with training in home economics has been rewritten by a group of authorities with a view to offering a valuable and reliable aid in the teaching of nutrition and diet for both sick and well patients. Emphasized is the fact that therapeutic diets are normal diets modified to suit special needs. The use of a basic dietary pattern is recommended in all instances in order to insure the nutritional adequacy of all diets, even those restricted because of special diseases. Because therapeutic diets are valueless unless eaten, the authors call attention to factors which help to induce the patient to eat; they emphasize that the patient is a person and must be treated and fed as such. The style is simple and direct. The book is divided into four sections of approximately equal length which deal with the principles of nutrition, diet in disease, food selection and preparation, and tabular material and special tests. The double column page is used for ease of reading. The material is well organized and especially adapted to the volume's chief purpose—a textbook for student nurses. As a reference for advanced students there is an abundance of valuable and usable tabular material in the fourth section together with references for special reading. The glossary is valuable to the beginner. The table of contents and a good index makes it easy to find special subject matter.

The Incidence of Neurosis Among Factory Workers. By Russell Fraser, with the collaboration of Elizabeth Bunbury and others. Medical Research Council, Industrial Health Research Board, Report No. 90. Paper. Price, 1s. 3d. Pp. 66, with 23 illustrations. His Majesty's Stationery Office, York House, Kingsway, London, W. C. 2, 1947.

In 1942 Dr. Russell Fraser and his English collaborators, believing that neurotic illness was responsible for a considerable amount of absence from war work, undertook a study of the incidence of neurosis among factory workers. In all, 3,083 adult workers were examined in thirteen light or medium engineering factories in which over 30,000 workers were employed. This number examined represents 80 per cent of the original random sample. The other 20 per cent, for one reason or another, could not be examined. The inquiry was concerned with "recent" health and circumstances during a series of periods of six months between September 1942 and December 1944. The data collected provided information about the health of the workers in the engineering trade under stabilized wartime conditions. "Recent" referred to the past six months and "prewar" to the whole of the worker's prewar life. The term as used in the report concerned any psychologic or mental illness (i. e., any disability for which there was apparently a psychologic cause or partial cause, including anxiety states, mild depressive states, obsessional states, hysteria and also a few instances of psychosis which were discovered among the study group). The term does not include original nervous diseases. Minor neuroses were considered as abnormalities of personality unassociated with symptoms. The main results of the inquiry are clear: 10 per cent of the workers studied suffered from definite or disabling neurotic illness; neurosis caused between one fourth and one third of the absence from work due to illness, and certain features in the individual workers or in their environment were associated with a varying incidence of neurosis. Although the sample was probably as representative as practical in such a study, the sampling limitations leave uncertain the extent to which these findings may be generally applicable. However, in these days of underproduction and manpower shortage, industry can hardly afford to neglect the disturbing implications of Dr. Fraser's report.

Practical Psychiatry and Mental Hygiene. By Samuel W. Hartwell, M.D., Assistant Director, Department of Mental Health, State of Michigan, Division of Mental Hygiene and Child Guidance, Lansing, Mich. Cloth. Price, $3.75. Pp. 439. McGraw-Hill Book Co., Inc., 330 W. 42d St., New York 18, 1947.

A man who has taught psychiatry to nurses for twenty years has published this book to accomplish four goals: (1) to help the student develop a dynamic interest in psychiatry; (2) to make psychiatry more easily understood; (3) to make the teaching of psychiatry practical, and (4) to permit flexible use of the test. The book is divided into four parts, namely, the introductions, medical psychology, psychiatry and mental hygiene. The textual matter is clearly written and easily understood. This book is recommended for the use of the student nurse and the psychiatric social service worker.

Mind and Body: Psychosomatic Medicine. By Flanders Dunbar, M.D. Cloth. Price, $3.50. Pp. 263. Random House, Inc., 457 Madison Ave. New York 22, 1947

This book is intended for the lay reader, although the general physician will also find it interesting and profitable to read. The author writes authoritatively as the pioneer of the subject generally termed psychosomatic medicine. The style is simple and nontechnical, sustaining interest throughout. The most frequent questions and doubts of the people are adequately answered by the contents, which include discussions of typical physical disturbances caused by emotional conflicts. The book is highly recommended.

Unipolar Lead Electrocardiography Including Standard Leads, Unipolar Extremity Leads and Multiple Unipolar Precordial Leads. By Emanuel Goldberger, B.S., M.D., Adjunct Physician, Montefiore Hospital, New York. Fabrikoid. Price, $4. Pp. 182, with 88 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1947.

This monograph was expectantly awaited because the author has done much to popularize the recent development of the so-called unipolar limb leads. A review of this book must deal with two aspects: (*a*) the theory of the unipolar leads and its practical application and (*b*) the adequacy of the presentation of the subject by the author. In its early development with the limb leads, electrocardiography recorded the differences in the electrical effects of the heart on the two electrodes which form each limb lead. With the advent of precordial or chest electrocardiography, the difference in the effect on the two electrodes used in such recording was much greater. The difference in effect approached but did not equal the unipolar method obtained by connecting an electrode on the surface of the exposed heart with an "indifferent" electrode at a distance on the body. Wilson therefore endeavored to obtain a true unipolar precordial, or V, electrocardiogram by using the central terminal which he and his group developed. They published a communication dealing with the possibility of getting similar unipolar leads by connecting the central terminal with an electrode on an extremity. The author amplified and simplified this method with his augmented unipolar, or aV, leads. These V or aV leads, if the theory of the Einthoven triangle is applicable to the human body, should give the electrical effects of the heart only on the exploring electrode. The theory of the Einthoven triangle as a theory is correct. But its application in clinical electrocardiography is still disputed. There is no universal agreement that the postulates which would make the central terminal a null electrode are fulfilled, and actual recording of the potential of the central terminal shows that it is not a true null electrode. As far as precordial leads are concerned the error of this assumption is not too great and the central terminal may be considered as good and under certain circumstances a better "indifferent" electrode than an electrode placed on one of the extremities. However, any deviation actually from the Einthoven theory would make the utilization of a central terminal or Goldberger's modification less reliable in obtaining a true unipolar limb lead. That this is so is shown by the fact that while theoretically the algebraic sum of the records obtained with V_L, V_R and V_F, or with aV_L, aV_R and aV_F, should equal zero, and this Goldberger states in his book; actually this is not so in many cases. For example, in figure 64 of this book the sum of QRS of aV_L, aV_R and aV_F is far from zero. It would appear therefore that the strict interpretation that the V or aV limb leads are truly unipolar leads has not been verified. If the reader bears these facts in mind he may properly evaluate the merits of so-called unipolar lead electrocardiography.

When one turns to the presentation as contrasted with the theory of this book, one will be impressed that the material has been somewhat hastily put together and that the development is not as logical or succinct as in Goldberger's original articles. In addition, one finds that the interpretation of the aV limb leads is largely arrived at empirically as far as normality, abnormality and significance is concerned. Thus, the older electrocardiographer will have to learn a new set of criteria for the so-called unipolar limb leads in addition to those he is already familiar with as far as the ordinary limb leads are concerned.

The exposition of the V chest leads is adequately presented, but this material is now well known and would therefore not by itself justify the publication of a new monograph. The author properly stresses the recent developments concerning the influence on the electrocardiogram of the position of the heart. However, it is an error to believe that this is more readily to be obtained by the use of aV limb leads than by ordinary limb leads, as the reader can determine for himself by referring to the excellent studies with ordinary limb leads which Ashman and his colleagues have published.

There are a number of errors of fact, some minor and some more serious, in the book which the author should correct in the next edition. The style is involved and the text is complex, so that it will be difficult for the beginner. Other publications present the theoretical material more succinctly and clearly.

With all its faults this book is recommended for two groups of readers: (*a*) the established electrocardiographer who desires to evaluate critically this newer development in "unipolar electrocardiography" and (*b*) the beginner in electrocardiography who may find that, despite the fallacies of theory, he obtains a rational analysis of electrocardiography which makes him appreciate the theory and thus makes it easier for him to apply this tool clinically. Both types of readers must be cautioned, however, to avoid the snare that this is an accurate development of the theory. They should recognize that actually the application of theory is a crude approximation of the truth. It cannot be denied that the unipolar limb leads as recorded in this book may turn out to be of value in certain restricted cases, as, for example, in the diagnosis of hypertrophy of the right heart and in the evaluation of Q$_3$. It is difficult to believe, however, that the so-called unipolar extremity leads will replace the ordinary limb leads. In fact, it would be a great mistake to believe that they add much to one's practical information when one routinely takes precordial leads from at least three chest positions in addition to the ordinary limb leads.

A Study of Individual Children's Diets. By E. M. Widdowson. Medical Research Council, Special Report Series, No. 257. Boards. Price, 6s. Pp. 196, with 93 illustrations. His Majesty's Stationery Office, York House, Kingsway, London, W. C. 2, 1947.

This study comprises observations made on 1,000 children, aged 1 to 18 years, between 1936 to 1939. Dr. Widdowson is well qualified from her previous chemical and analytic studies, which date back to 1925. The study presents many interesting facts, and one is impressed with their careful and thorough analysis. Among the most striking revelations were the rather wide variations in caloric intake which were compatible with good health and average physical development. To the American reader the chapter on "beverages" is of interest. She notes that the "small beer" which for centuries was the customary drink of children has been replaced by tea and also to some extent by milk, the average amount of milk being less than a pint a day. This book will be valuable and instructive for any one interested in nutrition and development in childhood.

Communicable Diseases. By Franklin H. Top, A.B., M.D., M.P.H., Medical Director, Herman Kiefer Hospital, Detroit, and collaborators. Second edition. Cloth. Price, $8.50. Pp. 992, with 108 illustrations. The C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, 1947.

This is the third edition of a deservedly popular work. The author has added to the volume from authoritative sources on coccidioidomycosis, rheumatic fever, epidemic diarrhea and the like so that the book approaches somewhat a textbook of medicine. Although what is said is worth while, it is a question whether too much or not enough has been said and whether the material may not be too much for such a volume. It gives a sparse report on clinical problems which are not considered completely enough. The detail has been carefully worked out and presented, and the author shows an obvious knowledge of up-to-date literature.

Suggestive Therapeutics: A Treatise on the Nature and Uses of Hypnotism. By H. Bernheim, M.D. Translated from the second French edition by Christian A. Herter, M.D. [Originally published in 1889.] Cloth. Price, $5. Pp. 420, with illustrations. London Book Co., 30-41 50th St., Woodside, Queens, New York, 1947.

This reprint of Herter's translation of the classic work on hypnotism is timely because of the revived interest in hypnotism as a therapeutic procedure. Many of the recently discovered phenomena can be read in this original work, indicating that little progress has been made in the field. All who use or contemplate using hypnotism should have this classic work in their library for reference.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

DEATH IN THE BASSINET

To the Editor:—In the February 1948 *Woman's Home Companion* there appears an article, anonymously written, entitled "Death in the Bassinet." In substance the article is an indictment of the medical profession for advising parents to place infant babies in the prone position when sleeping. What is current medical opinion regarding this practice?

M.D., Cobleskill, N.Y.

ANSWER.—The anonymous author reported the sudden death of his 10 month old son. The father feels convinced that the death was due to the fact that the child was placed in his crib in the prone position. One day, when the mother made her bimonthly visit to the pediatrician, it was noted that the friction of the bedding had caused an irritation on the back of the baby's head, so the doctor advised putting the baby face downward during his nap. The mother, acting on the advice of the physician, put the baby in the bassinet in the prone position. The baby was heard to cry, vomited a part of his previous meal and when the parents reached the baby in his bed he had expired.

Evidence is insufficient to prove that the prone position of itself was the cause of sudden death. Most pediatricians have seen many young infants who select by preference the face down position without unfavorable results; though it is granted that many mothers fear this position for their sleeping infants. Pillows should not be permitted either in the bassinet or in the carriage. The mattress should be firm, flat and smooth, so that the baby cannot push his face into a depression. The mattress in the carriage should fit well without space around the edge in which the baby may become wedged. There are many causes for sudden death in infants, most of which can be revealed only by a carefully conducted necropsy.

The formerly accepted diagnosis of thymic death is no longer accepted as meaningful, and most pathologists and clinicians reject this explanation as obsolete. There are some cases on record in which an infant has buried his face in a soft pillow and shut off his supply of air. Not infrequently, cases are reported to the coroner, of babies who have become accidentally strangulated in their beds or carriages with bands of clothing, blankets and restraining garments which have become wound around their necks. Other occasional causes of sudden death are briefly mentioned, such as an acute bronchopneumonia. Spontaneous hemorrhages into the lungs or peritoneal cavity occasionally occur; apoplexy of both adrenal glands has been reported and hyperacute attacks of fever such as meningococcus infections. Some have sought to explain sudden death as the result of an anaphylactic shock. Others have suggested the cause to be laryngospasm of tetany, though symptoms of tetany were not found before the fatal attack. One author thought the fatality was caused by hypoglycemia due to adrenal insufficiency.

One of the common causes of sudden death in young infants is respiratory obstruction from aspirated particles of food or mucus. The obstruction happens when vomiting of stomach contents is associated with crying. Food is thereby drawn into the air passages. Most of these accidents have been observed in infants less than 6 months of age. On necropsy one finds that either a large curd of milk has obstructed the larynx or in other instances there is food (usually milk or cereal) or mucus in the respiratory tract. In some cases infants have been suffocated by aspirating a dusting powder such as stearate of zinc from a container with which the baby was playing. In the London *Lancet*, Feb. 28, 1948, appeared an analysis of recent cases (1945 to 1947) coming under the jurisdiction of the Leeds Coroner's Court: 21 infants aged 9 months or less died suddenly due to aspiration of vomited food stuffs. It is probable that another 10 infants in whom the cause of asphyxia was not ascertained or was reported to be due to some other factor also died as the result of aspiration of regurgitated food substances. Soft feather pillows were held to be responsible for 2 deaths and probably responsible for 4 others. In 1 case suffocation by a shawl was believed responsible for a sudden death.

URINARY COLLOIDS

To the Editor:—Please give references and discuss influence of urinary colloids as related to the formation of stones in the urinary system. Are there satisfactory means of qualitative or quantitative determination of colloids in the urine?

Arthur J. Datt, M.D., Pensacola, Fla.

ANSWER.—The term "urinary colloids" suggests that the inquirer is thinking in terms of specific substances rather than in terms of the state in which some of the urinary constituents may exist. One should speak in terms of the "colloidal state" of substances. Conceivably inorganic substances such as phosphates of calcium and other substances may be held in part in the colloidal state in a fluid like urine. The organic substances which would most likely be involved in bringing about this colloidal state of such inorganic constituents are proteins. A standard quantitative method for determining colloids in urine is not available, but the quantitative estimation of total proteins, calcium phosphates and oxalates might throw some light on the factors which contribute to the colloidal state, which might easily be involved in the formation of stones in the urinary system. In some cases the suspended material in the urine may consist of tissue debris, and this might also be a contributing factor to the formation of calculi. If such cellular debris exists in urine it could, of course, be separated by centrifugation and be identified by appropriate microscopic examination.

CYSTIC OVARIES

To the Editor:—1. (*a*) Is it advisable to have healthy ovaries after hysterectomies in women before menopause? (*b*) How great is the danger of future development of cystic ovaries? (*c*) Are not the natural hormones secreted by the remaining ovaries better than the substitution therapy of the artificial menopause? 2. A great number of obstetricians claim that low flap cesarean section does not have advantages over classic cesareans. Discuss the types of cesarean section, the intraperitoneal and the extraperitoneal.

M.D., Pennsylvania.

ANSWER.—1. (*a*) Considerable discussion is still taking place on the advisability of leaving healthy ovaries after hysterectomy in women before the menopause. Some prominent gynecologists recommend that ovaries be left after the menopause. Reasons for removing the ovaries are that in a fair number of women there subsequently develop cysts which necessitate another major operation; fair evidence exists that many women near the climacteric go through the menopause within a few years following hysterectomy. One experienced surgeon now leaves the ovaries in women under the age of 40 but removes them in patients 40 years or over. Assuming that the ovaries are normal and other reasons for removal do not exist, recent observations indicate that removal of ovaries may decrease the hazard of cancer of the breast. Therefore women with a family history of frequent cancer should have the added protection of bilateral oophorectomy, especially older women.

(*b*) The incidence of cystic ovaries requiring surgical removal following hysterectomy is obscure. Estimates vary from 5 to 20 per cent depending on the surgical technic.

(*c*) Hormones secreted by a normal ovary are probably better than artificial therapy, but one must remember that a cystic ovary may or may not function abnormally. All women face menopause inevitably unless they die prematurely. Serious catastrophe associated with menopause does not occur when the patient is properly prepared for it and appropriate management

is arranged and followed.

2. Obstetricians differ on transperitoneal or intraperitoneal cesarean sections. Generally obstetricians who have thoroughly investigated the virtues of the classic and the low flap cesarean section favor the latter. The most likely exception to the latter procedure would be in placenta previa, particularly when the placenta is on the anterior wall. Many now perform the low flap type. Surgeons should not attempt cesarean sections, classic or otherwise, unless able to do both types. Inquirer is referred to Stander, "Textbook of Obstetrics," and DeLee-Greenhill, "Principles and Practice of Obstetrics."

LEITZ COLORIMETER

To the Editor:—What is the value of the Leitz photoelectric colorimeter? Is it sufficiently reliable to use in the determinations of blood sugar and blood urea and for other laboratory procedures requiring the use of a colorimeter? Are the methods outlined in the handbook which accompanies the colorimeter acceptable, reliable methods? If this colorimeter is not accurate, are there any on the market which are?

M.D., Minnesota.

ANSWER.—The Leitz clinical photoelectric colorimeter is suitable for many clinical laboratory determinations that depend on the measurement of the depth of color or turbidity of a prepared test solution.

The laboratory procedures outlined in the handbook which accompanies this colorimeter are standard methods adapted for use with the apparatus. Accuracy is well within the limits required for clinical test purposes. The colorimeter may be purchased precalibrated for use.

The use of this instrument or any other colorimeter presumes a knowledge of standard technics and manipulation in the preparation of test materials and reagents.

ARTERIAL INJECTION

To the Editor:—In cases of extreme shock intracardiac injections of "adrenalin" (epinephrine) have been used. Recently this practice has been criticized as being fraught with danger. Please comment on use of epinephrine injected into the common carotid.

D. C. Wilkinson, M.D., Oconomowoc, Wis.

ANSWER.—A number of drugs have been injected into the arteries of man. Drugs which ordinarily produce arteriolar relaxation, such as papaverine, histamine and acetylbeta-methylcholine chloride, cause rather pronounced improvement in the circulation. It is probable that a significant amount of epinephrine hydrochloride injected intra-arterially will cause sharp and sustained arteriolar constriction which will jeopardize the integrity of the arterial circulation to the brain in a serious way. Certainly epinephrine hydrochloride should not be injected into the carotid artery of man until appropriate studies on animals have been made.

AXILLARY MAMMARY TISSUE

To the Editor:—A woman aged 32 was first seen by me one year ago for pain in both axillas. Over a period of several months the pain in the right axilla totally subsided while that in left persisted. Apparently the pain in the left axilla was cyclic, being more disturbing to the patient at the time of her menstrual period. History indicated that she received 1 mg. diethylstilbestrol daily and daily doses of progesterone 5 mg. in the latter half of her menstrual cycle over a period of six months. The above medications were interrupted during menopause. When first examined, the patient's skin appeared slightly coarse and her breasts were increased in size. No masses were palpable in the axillas. With total discontinuation of the foregoing medicaments, her complexion reverted to its normal texture and the breasts to their normal size. The pain in her right axilla was the last to disappear, while the pain in the left axilla appeared aggravated with menstruation. For the past few months of menstrual time small lymph node-like areas can be palpated in both axillas. These disappear in the intermenstrual period, but recur at menstruation, when the left axilla becomes tender to palpation. Although these "nodes" have not increased in size since first observed several months ago, the patient is especially concerned about their potentially becoming malignant. What is the etiology of this condition? Is diethylstilbestrol a factor or coincidental? What treatment is recommended?

M.D., Michigan.

ANSWER.—It is not clear from the query why this patient 32 years of age with normal menstrual cycles was receiving fairly large doses of diethylstilbestrol and of progesterone or whether this was proper treatment. Presumably, these were given for breast pain occurring at time of menstruation but obviously they aggravated the condition.

Probably this patient has masses of mammary tissue in each axilla, a condition often observed for the first time in patients while lactating. The pain noted in each axilla during menstruation is probably due to the cyclic hypertrophy of this mammary tissue aggravated by the medication. These "lumps" are no more likely to become cancerous than any other mammary tissue, unless it is true that overstimulation from diethylstilbestrol leads to cancer.

For treatment, it is suggested that the medication described be considered inappropriate for a woman of this age, particularly in view of the reaction, and therefore be discontinued. Small doses of testicular extract could be substituted for reasonably short periods of time, if necessary and indicated because of pain and swelling; warm wet compresses are helpful.

SKIN GRAFTS

To the Editor:—Please give information and references concerning use of split thickness grafts around colostomies that are causing irritation to the surrounding skin.

Arch J. Beatty, M.D., Longview, Wash.

ANSWER.—In 1941 L. R. Dragstedt, G. M. Dack and J. B. Kirsner (Chronic Ulcerative Colitis, Summary of Evidence Implicating Bacterium Necrophorum as an Etiologic Agent, Ann. Surg. 114:653-661, 1941) described a skin-covered ileostomy as a method of preventing excoriation of the abdominal wall in patients requiring ileostomy for chronic ulcerative colitis or other diseases of the colon. This method has been subsequently used in a number of clinics and found to be satisfactory for this purpose. The method is applicable to a colostomy and may be indicated when the discharges cause severe irritation of the skin. Usually, however, cutaneous irritation can be prevented after a colostomy by adjustment of the diet together with a well fitting colostomy bag.

LEUKEMIA

To the Editor:—Is folic acid of value in the hemorrhages of acute leukemia? Has it any influence on the course of the disease? Will it help the anemia which accompanies acute leukemia?

R. P. Little, M.D., Dwight, Ontario, Canada.

ANSWER.—Folic Acid has been used in several cases of acute leukemia without apparent effect (Doan, C.A., *Am. J.M. Sc.* 212: 257, 1946; Zuelzer, W. W.: *J.A.M.A.* 131:7, 1946). This is to be expected, as folic acid has been found to be effective only in the macrocytic anemias associated with a megaloblastic bone marrow.

PARINAUD'S SYNDROME

To the Editor:—I have recently observed several cases of severe febrile conjuctivitis. The conjunctival bulb is free. The conjunctiva shows large granules on the lower lid only. There is a moderate discharge of liquid pus. The lower lid and its surroundings are edematous. The temperature is about 104 F., but the patients (mostly small children) do not appear sick or have photophobia. In 1 case there was painful enlargement of a preauricular node. Complete cure occurred with sulfonamide drugs and penicillin within three or four days. Other observations to explain the fever are absent.

M.D., Springfield, Mass.

ANSWER.—What is described is probably a Parinaud's syndrome. This is not a disease entity, since many organisms have been reported as the cause of the condition. It is usually a unilateral conjunctivitis associated with an enlarged preauricular node and with mild to high temperatures. Since it is infectious, the second eye may become involved. In this country localized infection with generalized tularemia is not infrequently seen. The course is usually prolonged, but perhaps the sulfonamide drugs and antibiotics may have shortened the course. Leptothrix, streptothrix and tuberculosis have been mentioned as the etiologic factors in cases of Parinaud's conjunctivitis. This, of course may have been only an unusually virulent infection with a pyogenic organism with involvement of the preauricular nodes.